THE LEAN TRAINING SYSTEM

VELACTION
Continuous Improvement®

CONTINUOUS IMPROVEMENT
DEVELOPMENT
GUIDE

CREATING THE SYSTEMS
FOR LEAN SUCCESS

Dear Continuous Improvement Voyagers,

Thank you for choosing us to assist you on your Lean journey. We recognize how important this decision is. The guide you select can make all the difference in your success, and we are honored that you have chosen us to help you.

Before you dive into this guide, we want you to keep in mind that every journey is different. The needs of companies vary for a variety of reasons. Industries have specific requirements. Whether you are a service company or a manufacturer also defines where your effort should be focused. The composition of your team also plays a role.

We encourage you be flexible in how you apply this material. Pick the training that fills in your gaps, but make sure to stay focused on the principles.

Finally, we encourage you to seek help early and often. This can come from professionals, or it can come from the wealth of social media connections, websites, video sites and other online sources. The bottom line is to make sure to leverage those that have come before you and learn from them.

Finally, good luck and best wishes on your Lean journey.

Jeff Hajek
Owner and Founder of Velaction Continuous Improvement

Continuous Improvement Development Guide

The Lean Training System

Velaction Continuous Improvement
Mill Creek, WA
www.Velaction.com

Version 8/20/2015 (Beta Edition)

DISCLAIMER

The purpose of this tutorial is to provide information on continuous improvement. The information is not intended to provide advice about any legal, financial, accounting, engineering, tax, psychological, or other professional services. If legal or other expert assistance is necessary, the services of a competent professional should be sought.

This tutorial is designed to educate and entertain. It includes information gathered from multiple sources, including many personal experiences. The reader should use this document as a general guide and not as the ultimate source of information. It is not the purpose of this document to include every possible bit of information regarding this subject, but rather to complement and supplement other resources available to the reader. You are urged to read as much available material as you can find and to learn as much as possible about continuous improvement; you are then encouraged to tailor the information to your individual needs. The suggestions offered may not be suitable for every situation. Likewise, the examples provided within are not meant to imply that the reader will achieve the exact, same results. Each instance will vary.

The author has made every effort to make sure that the information contained in this tutorial is reliable and accurate based on information available as of the publication date. However, it is difficult to ensure that all information provided is entirely accurate and up-to-date. Therefore, the author and the publisher accept no responsibility for any inaccuracies or omissions and specifically disclaim any liability, loss, or risk, personal or otherwise, that is incurred as a consequence, directly or indirectly, of the use and/or application of any of the contents of this book. While inspired by actual events, all case studies, events, locations, organizations, persons, and characters contained in this material are completely fictional. Any resemblance to any events, locations, organizations, persons, or characters, real or fictional, living or deceased, is entirely coincidental and unintentional, unless specifically noted. There is no guarantee that any websites or links mentioned herein will remain active.

If you do not agree with, and do not wish to be bound by the above terms, do not read this document. By using this information, you agree to the above terms.

Purpose

This guide is intended to provide you with a roadmap to developing your continuous improvement business system, as well as the culture to support it. It is not a stand-alone document. In addition to providing the roadmap, it will also offer links to get what you need to support you on your journey. This links include a wealth of free materials, as well as recommendations about products we offer. While we certainly hope you choose to purchase materials from us, and we do use this guide to support our business, we designed it to be helpful even if you purchase nothing from us.

Vision

Our vision is to create a comprehensive, world class guide to becoming a continuous improvement focused organization. To that end, we have three main goals.

1. *We want to support you creating a business management system.* Companies need a method to their madness in order to thrive. A business system standardizes routine decisions and processes and lets your team focus on problem solving and capitalizing on opportunities.
2. *We want to help you create a continuous improvement culture.* Without the right people on your team, you will struggle to become a great company. A culture of improvement brings out the best in people, and lets them bring out the best in the company.
3. *We want you to be self-sufficient.* Our system is designed to help you help yourself. Bringing in outside help can be expensive and can be risky. We want to create tools that let you combine our expertise with your deep knowledge of your company to get great, lasting results.

TABLE OF CONTENTS

BUILDING A BUSINESS SYSTEM

Create a Business Structure to Support Your Team's Success.

It is relatively easy to learn a variety of continuous improvement tools and start putting them to use.

What is much harder to do, is to make those tools become an integral part of the way the company does business. In most cases, the tools are used sporadically. They are applied as an afterthought. And to make matters more difficult, many the tools are only known by a handful of individuals.

It is extremely hard to create a culture of continuous improvement under those conditions.

Those companies that truly understand Lean, though, work to develop a business system. What do we mean by system? In a nutshell, it is simply a collection of processes for managing and operating the company.

Nearly everything that a business does has a process associated with it. The more structured those processes are, the more an organization's energy can be conserved to apply towards problems and opportunities.

Now, a business system does not mean that you turn the organization into non–thinking robots. It means that you take the repetitive activities and decision-making out of their hands so you can unleash their creativity on important things.

Later in this guide, you'll see our continuous improvement transformation model. This model breaks down the transformation from where typical company starts to a

situation where they have a robust business management system in place.

Creating a business management system is not an overnight endeavor. It will take a shift in the way people think about their work. It will require building a culture of continuous improvement. It will require managers to shift from gut feel leadership to a combination of instinct backed by facts and data.

When creating a system, most people focus on tools. Instead, I would like you to work on integrating a set of principles into your corporate culture.

Our transformation model contains a progressive set of these principles.

Transformation Principles

PHASE 2: COMMITTING

In the committing phase, the key leaders of an organization turn the corner from accepting business as usual to choosing a new path. It is one of the most difficult of the phases because it entails accepting that there is a flaw in the way the business is currently being run.

- **Build Relationships:** In the later phases, it is imperative that team members and the leaders in the organization work together. It takes a long time to cultivate a strong relationship, so it has to start early in the process of change.

- **Develop Trust:** An integral **part of relationships is trust**. It is important

enough to warrant a separate principle. Team members have to feel safe and confident in their bosses. Leaders have to believe that team members will act in the best interest of the organization.

- **Develop Leaders Internally:** Great organizations push themselves. Weak leadership results in a lack of stretch goals, and an inability to successfully reach them, regardless of how demanding they are. **Strong leadership** gives an organization purpose and direction

- **Show Respect for People:** First of all, **treating employees respectfully** is the right moral thing to do. After all, employees are people. They are not bodies, heads, etc. But beyond that it is good for business. Respect breeds satisfaction, and satisfaction breeds success.

- **Think Long Term:** Far too often, people think in a short timeline and don't invest in the future. Creating a strong business system takes time and requires patience.

PHASE 3: STARTING THE JOURNEY

There is an old expression that says even the longest journeys begin with a single step. The same is true when developing a continuous improvement culture. You won't immediately reach your destination. This phase transitions the leadership team from deciding to acting and sets the tone for your Lean journey.

- **Look Within:** There is a tendency to focus on external factors and other people when facing barriers and obstacles. It is important to look at yourself first. This remains important throughout the development of a business system. The performance bar is continually raised. If you continue to operate at a static level, you will eventually become a barrier to progress.

- **Align the Team:** It should come as no surprise that great organizations have a unity of effort. **Leadership tools like policy deployment** and operations reviews are the tools for getting the team working together. The guiding principles on this list, though, are the bedrock of that alignment.

- **Avoid Bureaucracy:** Organizations without strong principles need lots of rules and policies to get things done. When you have a strong belief system, you need less bureaucracy to be effective.

- **Invest Wisely:** Continuous improvement is not free in the same way that buying a rental property has an upfront cost. Eventually, if you do the right things, you'll eventually get a payoff. But it is important to make sure that everything you spend has a purpose and will contribute to your overall goals. **One of the best investments you will make** when developing your business system is in people.

- **Know Your Customers and What They Value:** It is impossible to be successful in the modern, competitive world without understanding what your customers want and are willing to pay for. **Pay close attention to the Voice of the Customer (VOC)**.

PHASE 4: BUILDING THE FOUNDATION

There are some key skills that your team will need as you develop your business system. You'll also need some basic structure and systems. The focus of this phase is developing the required talent and building a Lean infrastructure.

- **Focus on Processes:** Processes are the lifeblood of any business system. If people do things in a haphazard manner, you can't expect consistent results. And without consistent results you cannot rely upon each other.

- **Learn to Learn:** People have three basic problems when it comes to learning. The first is that they don't know what they don't know. The second is that when they do see a knowledge gap, they tolerate it. The final problem is that they don't know how to close the gap when they do identify it as a shortcoming.

- **Build and Empower Teams:** If you can replace your team with a robot, you're not using them properly. Strong teams have the proper training to make decisions in the absence of leaders.

- **Create Structure:** Creating a business system based on a **continuous improvement culture needs the right framework** within which it can operate effectively. This structure doesn't happen by accident. It needs to be planned and maintained for the business system to flourish.

- **Embrace Simplicity:** We often confuse technology with effectiveness. Now, technology is fine when it makes things better, but technology for its own sake is not. Look for the simplest solution first, even if it is not as exciting as other options.

PHASE 5: RAMPING UP

Once the foundation is built, it is time to start building upon it. In the early part of the ramp up, you'll probably focus on cultivating talent. While that sort of growth never goes away, by the end of the ramp up phase, most people on your team should have at least some continuous improvement experience. At that point, there will be a subtle shift from learning and teaching as the priority to a greater focus on results. Learning should not go away, but there will be a change in the ratio of how time is spent. Note that this phase can take a number of years. It is important to be patient.

- **Structure Your Thinking: People need to think scientifically**. That means that they gather and interpret facts about a problem before acting. This way of thinking is unnatural for many people.

In the early days of humanity, fight or flight were the two basic responses when cavemen were presented with a problem. The decision had to be made quickly and was based upon what one had seen before. Modern problem-solving, though, tends to be ineffective when done with snap decisions.

- **Focus on Flow:** Every time works sits it creates a problem. It takes more energy and effort to manage it, and customers are waiting longer to get what they want.

- **Create Standards:** Continuous improvement requires a baseline the start and the **ability to recognize abnormal conditions**. This means that you have to have standards in place. Without them, there is no foundation upon which to improve.

- **Manage Your Value Stream:** Companies often erect artificial barriers within the organization. They arrange their functions as silos. That makes it hard to create value for customers. Instead, the company should be **arranged by value stream**.

- **Improving One's Job is Part of the Job:** Companies turn the corner on their Lean journey when employees start taking responsibility to make their own job better. In typical organizations, changes in work are driven by managers. When continuous improvement is part of the company's DNA, people become dissatisfied with

waste in their work and take action to do something about it.

Phase 6: Keeping Momentum

The risk during phase 4 is complacency. Once the company gathers steam, it has to keep it. Don't confuse this phase for steady state, though. The improvement trajectory should still be steep. It is just that it is using well-established systems with highly trained people. The stability of this phase also allows for greater experimentation with more sophisticated tools.

- **Build in Quality:** Every company understands the quality is important to their customers. Most, though, **inspect it into their products**. Great Lean companies **build quality into them**.

- **Adopt a Zero Defects Mentality:** This is a tricky principle. No company has ever achieved perfect quality. But that does not mean you shouldn't **strive for zero defects**. It is a mentality more than a goal, and it results in localized pockets of excellence. Get enough of those pockets, though, and quality ends up being pretty great.

- **Strengthen Your Systems:** Systems put tools into context. They also make sure that you understand how a change in one place will impact operations in another. Good systems also reduce the day-to-day effort required to run an operation.

- **Build Full Engagement:** Employee engagement is actually the result of

many other factors. Engaged employees, make customers happier, take the initiative more, and contribute to higher morale. The bottom line is that**employee engagement helps the bottom line**.

- **Monitor Processes:** It is important to manage operations and solve problems with actual facts and data. You don't get that information unless you **monitor processes**. Pay attention to that word choice. Make the distinction between scrutinizing people and tracking processes.

Phase 7: World Class Performance

Few companies will make the leap from phase 4 to phase 5. First of all, it is hard to uncover the subtle distinctions between a very good company and a great on. Secondly, even if you know what to do, it can be extremely difficult to do. Winning isn't easy.

- **Expect to Win:** There is a fine line between confidence and overconfidence. Top-performing companies know that they have the right team and systems to take on the competition and beat them.

- **Think Big:** The companies that have changed the world, or at least their industry, have always done it with great leaps forward. With a strong business system in place, an organization opens up more possibilities.

ABOUT THE LEAN TRAINING SYSTEM

Using Our Lean Training System to Get Outstanding Results.

The Lean Training System started out as a collection of training modules. It was intended originally as an à la carte system that instructors could piece together into their own customized training plan.

While this early version was growing, Velaction was also publishing a rather impressive online resource known as *The Continuous Improvement Companion.* This contained hundreds of terms, plus an extensive collection of forms, tools, articles, FAQ's, and continuous improvement strategies.
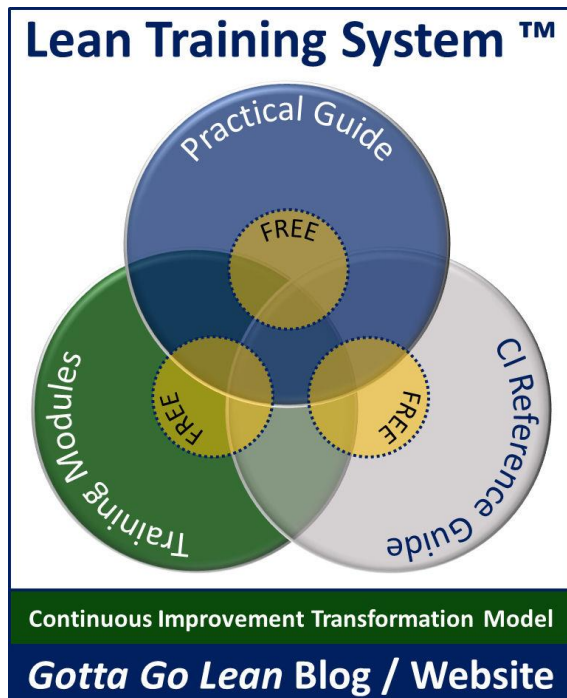
On top of that, Velaction also publishes the *Gotta Go Lean* blog. This online resource contains a mashup of continuous improvement articles, interviews, podcasts, current events, and, essentially, anything we find interesting.

The big shortcoming of how we were supporting training was that there was very little cohesiveness between all of the materials we'd been creating. That led to us beginning work on *The Nuts and Bolts Guide to Continuous Improvement.* This was meant to be a step by step 'practical guide' style approach to continuous improvement, delivered in bite-size lessons.

It dawned on us, though, that there is a tremendous amount of overlap between all of the materials reproduce. Rather than creating redundant materials to ensure completeness of each of these options, we combine them into one connected system.

So, *The Lean Training System* is now the umbrella for all of our materials. What we formally called *The Lean Training System* is now simply "training modules." The image on this page shows how everything fits together.

Lean Training System ™

Practical Guide

FREE

Training Modules

FREE

FREE

CI Reference Guide

Continuous Improvement Transformation Model

Gotta Go Lean **Blog / Website**

Note that we still offer a large amount of free materials on our website. This is available to any guest. We also have materials that are available to those of you that choose to subscribe to our updates or become a member on our site. This includes **over 100 free downloads** and extended content when logged in to our main site.

Individual vs. Team

We have designed our training material to be useful for you whether you are trying to learn on your own or want to develop your team.

- **Team Development:** We offer training materials that you can use to teach individual classes or that can be used to create a comprehensive training program. Our licensing terms are liberal. Most include a one time, permanent licensing fee. Corporate licenses allow you to share the information throughout your organization (restrictions apply, such as a limit of 20,000 employees per license.)

- **Individual Development:** Our wide range of Terms on PDFs, MP3s, Videos, Articles, forms & tools, and much more means it'll be a long, long, long time before you run out of learning opportunities.

Pricing

We have three basic levels of pricing.

- **Guest Content:** Our guest content is simply the free information that is available on our website for any visitor. This includes our online articles, many podcasts, and the online version of *The Continuous Improvement Companion.*

- **Subscriber / Member Content:** Signing up for our email updates gives you access to the **free downloads** available at Velactionstore.com. We use our shopping cart's digital download system so we can integrate these materials with our full training packages. This information is free, and no payment information is collected. Upgrading a subscription to a free membership gives you some additional benefits. You can get extended discounts on premium materials. You can register to see additional content on our website. And you can access our member portal to make future downloads and purchases easier.

- **Premium Content:** If you want to get more out of your training, our premium content is the most effective way to do that. Our training modules have a variety of components available. We also have a wealth of audio and video presentations. Of note, much of our premium content comes with a corporate license, allowing you to use materials throughout your organization. There are some restrictions. We require one license per reporting entity. Generally this means one license per president. We also limit standard licenses to organizations with 20,000 or fewer employees. Our full terms are available on our website.

Continuous Improvement Transformation Model

Breaking down Your Continuous Improvement Journey

We are frequently asked how to create a continuous improvement culture within an organization. The truth is, there is no one right way to do it. Like any process, it depends on the specific needs of the customer, available resources, the makeup and skills of the team, and a host of other factors.

Fortunately, though, there is a basic roadmap you can use to get your organization where you want it to go. The general approach below breaks a Lean journey into several phases that all companies go through on their Lean journey. Even if you've already begun your change, it is still helpful to look back at the previous phases to make sure you've got the structure in place to help your team thrive.

Our goal is to provide the tools you need to navigate yourself through this challenging transformation. But when you need a guide, we are there to help get you back to doing things on your own as quickly as possible.

If you have any questions or comments on this tool, please contact us at info@velaction.com.

TRANSFORMATION MODEL SUMMARY TABLES

	OVERVIEW					
TRACK	**Phase 2**	**Phase 3**	**Phase 4**	**Phase 5**	**Phase 6**	**Phase 7**
Phase Name	*COMMITTING*	*STARTING THE JOURNEY*	*BUILDING THE FOUNDATION*	*RAMPING UP*	*KEEPING MOMENTUM*	*WORLD CLASS PERFORMANCE*
Timeline (Time in phase)	Varies. Often initiated after a crisis.	3-6 Months	6-12 Months	2-5 Years	Ongoing. Final destination for most companies.	Not earlier than 7-10+ years, if achieved at all.
Description	The committing phase can be any length of time. It **starts with** the first rumblings of a continuous improvement program and ends with the communication of the decision to begin a Lean journey. Some Phase 1 activities may overlap the COMMITTING phase.	This phase primarily entails the leadership team making key decisions and establishing the system that will be used to track progress. There are many changes in the ways leaders operate, but few major process changes during this phase.	The foundation of a continuous improvement program is extremely important. It will make process changes much easier and more sustainable. Of note, a pilot area is often used to figure out how the company will do basic improvement processes.	During the Ramping Up phase, the groundwork has been laid, and the team is starting to focus on process improvement. This is where CI starts to spread across the organization and more sophisticated tools are introduced.	Once improvement efforts have spread throughout most of the company, it is important to keep up the momentum. This is not exactly a steady state phase, as the improvement line should still be steep. It is more of the saturation phase where everyone is involved in Lean, and the focus is on continually strengthening the culture.	Some elite companies pass from a strong CI culture to one that drives world class performance. One of the key characteristics of this phase is that grand thinking is embraced rather than squashed. The company continually stays ahead of the competition, and regularly makes game-changing breakthroughs.
Key Principles	• Build Relationships • Develop Trust • Develop Leaders Internally • Show Respect for People • Think Long Term	• Look Within • Align the Team • Avoid Bureaucracy • Invest Wisely • Know Your Customers and What They Value	• Focus on Processes • Learn to Learn • Build and Empower Teams • Create Structure • Embrace Simplicity	• Structure Your Thinking • Focus on Flow • Create Standards • Manage Your Value Stream • Improving You Job is Your Job	• Build in Quality • Adopt a Zero Defects Mentality • Strengthen Your Systems • Build Full Engagement • Monitor Performance	• Expect to Win • Think Big
Risk	**Extreme.** Easy to get derailed during the committing process.	**Moderate.** Focus is still on leadership team, so frontline pushback is limited.	**High.** Greatest resistance to change. Easy to undo Phase 1 work.	**High, diminishing to moderate.** Over time culture becomes ingrained. More employees coming into new culture; some departures.	**Low.** Very unlikely to change course at this point. Most changes fully integrated into systems.	**Extreme.** Few companies achieve world class performance, and few stay long.

CORE TEAM

TRACK	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7
Senior Leaders	*Major Activities* • Commit to creating a continuous improvement culture. • Identify mentors, if needed. • Educate and rally support of middle management. • "Sell" the need to change to team. • Commit resources to journey. *Key Prerequisites* • Mission statement • Core values • Strategy *Key Training* • Change Management	*Major Activities* • Begin using policy deployment. • Identify key business metrics. • Select pilot areas to develop new improvement processes. • Drive customer focus *Key Prerequisites* • CI Contract • Revised job description • Mentor identified *Key Training* • Executive Rollout Training • Lean Management Overview • Policy Deployment • Managing with Metrics	*Major Activities* • Conduct monthly PD/Ops Reviews. • Require countermeasures for "misses". • Require daily management in all production areas. • Require Value Stream Maps for all production areas. *Key Prerequisites* • KPI Boards posted *Key Training* • Operations Review Training • Countermeasures • Daily Management • Value Stream Mapping	*Major Activities* • Follow leader standard work / require it in subordinates. • Require future state value stream maps. • Lead steering team. *Key Prerequisites* • Production boards posted *Key Training* • Steering Team Training	*Major Activities* • Mentor A3 thinkers. • Create high-functioning teams. • Move to value stream management. • Develop leaders. *Key Prerequisites* • Work documentation process standardized • Resistant managers converted / eliminated *Key Training* • A3 Thinking	
Managers	*Major Activities* • Manage change in frontline teams. *Key Training* • Change Management	*Major Activities* • Manage new metrics. • Develop KPI boards. • Integrate PDCA into problem solving everywhere. *Key Training* • Manager rollout training • Managing with Metrics • PDCA	*Major Activities* • Develop CI processes. • Do countermeasures. • Oversee daily management. • Create value stream maps. • Pilot *kanban* *Key Training* • Manager rollout training • Daily Management • Countermeasures • Standardization • Standard Work • Value Stream Mapping	*Major Activities* • Follow leader standard work. • Standardize / document all processes. • Roll out *kanban* *Key Training* • Leader Standard Work	*Major Activities* • Develop flexible workforce. • Use future state VSMs to develop improvement plans.	

CORE TEAM (CONT.)

TRACK	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7
Frontline Leaders	*Major Activities* • Partner with frontline teams. *Key Training* • Change Management	*Major Activities* • Maintain KPI boards. • Lead 5S efforts. *Key Training* • Manager Rollout Training • Managing with Metrics • Working with Metrics • 5S & Visual Management	*Major Activities* • Support countermeasures. • Perform daily management. • Develop CI processes. *Key Training* • Daily Management • Countermeasures	*Major Activities* • Create visual workplace. *Key Training* • 5S & Visual Management	*Major Activities* • Cross-train teams. *Key Training* • Cross-training	
Frontline Teams	*Major Activities* • Learn about decision to change. • Learn about continuous improvement. *Key Training* • *Whaddaya Mean I Gotta Be Lean?* • Lean Overview	*Major Activities* • Begin 5S efforts. • Report data for KPIs. • Monitor process metrics. *Key Training* • 5S & Visual Management • Working with Metrics	*Major Activities* • Participate in pilot area improvement. *Key Training* • *Kaizen* Process Overview • Project participants receive training as needed	*Major Activities* • Operate with daily management. • Participate in *kaizen* (projects and daily improvement). • Perform operator total productive maintenance. *Key Training* • *Kaizen* training as needed • Total Productive Maintenance	*Major Activities* • Operate on self-managed teams. • Rotate jobs frequently. • Make daily improvements.	
Frontline Professionals		*Major Activities* • Be subject matter experts in problem-solving tools. • Focus on personal learning / OJT tool training. *Key Training* • Basic Problem Solving • Cause & Effect Diagram • Data Collection • Flow Charts • Pareto Charts • RCAs & The 5 Whys • Run Charts	*Major Activities* • Partner with production areas to provide project support. • Teach problem solving skills, as needed. • Focus on personal learning / OJT tool training. • Support / test CI tool rollout. • Create *Kanban* system *Key Training* • *Kanban* Overview	*Major Activities* • Use Design for Manufacturability in product development. *Key Training* • Design for Manufacturability	*Major Activities* • Use 3P / Production Preparation Process for product development. *Key Training* • 3P / Production Preparation Process	

INFRASTRUCTURE

TRACK	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7
Frontline Professionals		• Identify future resource team members.	• Establish resource team for project support and backfill.	• Grow size of resource team to support project needs.	• Integrate frontline leader training program into resource team.	
Resource Area	• Create project area. • Stock project area with project resources.		• Create Red Tag process and area.			
Knowledge Management	• Select / develop training materials.	• Establish knowledge management system. • Create Lean library. • Develop forms warehouse.	• Identify benchmarking partners. • Establish mutual tour program. • Make professional membership plan (continuous improvement organizations).	• Establish improvement database.	• Manage and update training materials.	
Forms & Tools	• CI Contract		• Red Tags			

MENTORSHIP

TRACK	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7
Internal Expertise	• Hire / appoint an internal expert.	*Major Activities* • Establish Lean Promotion Office.	*Major Activities* • Formalize CI processes. • Oversee pilot area development. *Key Training* • *Kaizen* Process Overview • *Kaizen* Planning and Chartering • *Kaizen* Process Walk • *Kaizen* Data Analysis • Making *Kaizen* Improvements • Sustaining *Kaizen* Gains	*Major Activities* • Identify cadre (future LPO). • Provide *kaizen* leadership. • Refine CI processes. • Manage steering team. • Support pilot area development.	*Major Activities* • Train cadre (future LPO). • Provide *kaizen* facilitation. • Attend continuing (advanced) CI training.	
External Expertise	• Decide on level of external support required. • Identify coach.	*Major Activities* • Complete Lean Assessment. • Develop CI roadmap. • Coach and train as needed.	*Major Activities* • Provide *kaizen* facilitation. • Support company strategy development. • Support CI process development. *More Support Options* • Boot camps (Daily Management, Countermeasures).	*Major Activities* • Create self-reliance. • Train cadre (future LPO). • Roll out advanced tools.	*Major Activities* • Provide on-call support for special projects / problems. • Support advanced learning • Train company trainers. *More Support Options* • Remote process reviews (via recordings or video conferencing)	

			SUPPORT TEAM			
TRACK	**Phase 2**	**Phase 3**	**Phase 4**	**Phase 5**	**Phase 6**	**Phase 7**
Human Resources	*Major Activities* • Coach leaders on change management. • Support hiring internal expertise. • Manage personnel issues. • Support communication plan. • Do personnel review for special situation / potential problems.	*Major Activities* • Revise job descriptions. • Revise hiring process to support CI. • Support voluntary and involuntary terminations.	*Major Activities* • Identify / develop CI talent funnel (LPO, Resource team). • Manage training records, if applicable.			
Information Technology			• Develop CI support processes.	• Increase staffing to handle project load.		
Facilities			• Develop CI support processes.	• Increase staffing to handle project load.		
Tooling			• Develop CI support processes.	• Increase staffing to handle project load.		

TRAINING & SUPPORT MATERIALS

TRACK	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7
Key Modules	• Change Management • *Whaddaya Mean I Gotta Be Lean?*	• Lean Overview • Lean Office Overview • Lean Management Overview • Policy Deployment • Managing with Metrics • Working with Metrics • 5S & Visual Management • Cause & Effect Diagram • Data Collection • Flow Charts • Pareto Charts • RCA & The 5 Whys • Run Charts • PDCA • Voice of the Customer	• Countermeasures • Daily Management • Standardization • Standard Work • Waste ID • Value / NVA • Value Stream Mapping • *Kaizen* Process Overview • *Kaizen* Planning and Chartering • Kaizen Process Walk (Office) • *Kaizen* Data Analysis • Kaizen Making Improvements (Office) • Kaizen-Sustaining Gains • *Kanban* Overview	• Quality Overview • Critical to Quality Metrics	• A3 Thinking • Controls Charts • *Poka Yoke /* Mistake Proofing • FMEA	

TRAINING MODULES

An À La Carte Approach to Continuous Improvement Training

Our early version of *The Lean Training System* consisted of just our modules. In its current configuration, the training modules are just one portion of the much more comprehensive training system.

Our modules are broken down by topic, with each module containing a variety of components. The central component is the PowerPoint presentation. From that, we develop a student guide, quizzes, and videos.

We often have forms & tools and terms from *The Continuous Improvement Companion* that are closely integrated with our modules. Many of these have audio programs as well.

Look on the following pages for a description of the components and their corresponding icons, as well as a listing of our training packages broken down into module groups.

(NOTE: If you are looking at a print copy rather than a digital version of this document, you can find the following information at www.VelactionStore.com)

COMPONENT DIRECTORY

	PowerPoint Presentations Our highly visual PowerPoint presentations are the central component to our training modules. While this component *can* stand alone, our slideshows offer a key advantage over other Lean training packages on the market. You can bolt on a variety of other modules to the training to create the perfect learning experience for your team. And finally, because we are so confident in our packages, we let you see thumbnails of every single slide so you don't just review a cherry-picked sample.
	Student Guides While printing out handout versions of our slideshows is an option, we offer you an even better one. Our student guides help students retain key information from the presentations by giving them a structured way to follow along with their note-taking. Blanks on the student guide are synced with icons on the slides to give trainees a heads up that they need to jot something down. Active participation in the training improves retention.
	Training DVDs Our Lean Training DVDs are great on their own. They provide a wealth of knowledge at an unbeatable price. But their value goes beyond that. They are created from our PowerPoint classes, which unlocks a variety of options for you. Use these videos as a leader's guide to see how we teach the classes, as part of a brown bag program, for makeup training, or even to indoctrinate new hires. Plus, the forms used in the DVDs are available for free to registered users of our site.
	Video Licenses Want your whole team to have access to the same great training videos? Our corporate licenses let you post a copy of the videos from our DVD library on your server for your whole team to view. This is a great option if you have a big team that is spread out at numerous locations. The license does not expire and the video is hosted on your own system, so you won't have to keep paying a subscription fee. We also offer small format videos licensed for individual viewing.

LEAN 101 MODULE GROUP

Lean Overview Training Module

Metrics, Working With, Training Module

Quality Overview Training Module

Standardization Training Module

Value / Non Value-Added Lean Training Module

Waste Identification Training Module

STANDARD LEAN TOOLS MODULE GROUP

5S and Visual Management Training Module

***Kanban* Overview Training Module**

Poka Yoke Training Module

Standard Work Overview Training Module

LEAN LEADERSHIP MODULE GROUP

A3 Thinking, Fundamentals of, Training Module

Change Management Training Module

Countermeasures Training Module

Daily Management Training Module

Lean Management Overview Training Module

Metrics, Managing With, Training Module

Policy Deployment Training Module

Value Stream Mapping Overview Training Module

PROBLEM SOLVING MODULE GROUP

Cause and Effect / Ishikawa Diagram / Fishbone Diagram Training Module

Data Collection Training Module

Flow Charts Training Module

Pareto Charts Training Module

PDCA Training Module

Root Cause Analysis and the 5 Whys Training Module

Run Charts Training Module

KAIZEN PROCESS MODULE GROUP

Kaizen Data Analysis Training Module

Kaizen Planning and Chartering Training Module

Kaizen Process Overview Module Page

Kaizen Process Walk (Office) Training Module

Kaizen Sustaining Gains Training Module

Kaizen-Making Improvements (Office) Training Module

LEAN OFFICE MODULE GROUP

Lean Office Overview Training Module

GENERAL CONTINUOUS IMPROVEMENT MODULE GROUP

Control Charts Overview Training Module

Critical to Quality Metric Overview Training Module

FMEA / Failure Mode and Effects Analysis Training Module

Voice of the Customer (VOC) Overview Training Module

Quick Links to Letters

NUMBER TERMS

- **1/3 – 2/3 Planning Rule (+ 2-Page PDF)**

 It is important to strike a balance in how much time is allowed for senior leaders to make a plan and for junior leaders to execute it. The 1/3 – 2/3 Planning Rule is a rule of thumb for allocating the time available for projects.

Learn More About This Term...

- **10-Foot, 3-Second Rule**

The "10 Foot, 3-Second" rule is a rule of thumb regarding **visual controls**. From 10 feet away, you should be able to assess the status of an operation within 3 seconds.

Learn More About This Term...

- **10-Year Old Mindset**

Continuous improvement often requires us to step outside what we believe to be true and look at the world in a new, different way.

Children do this on a regular basis. Why is the sky blue? How do birds fly? What would happen if you were driving at the speed of light and you turned on your headlights? This type of curiosity without fear is the hallmark of the 10 year-old mindset.

Learn More About This Term...

- **100% Inspection**

A 100% inspection is exactly what it sounds like. It is a check on every single piece of work. The inspection can be done on both physical products on the shop floor, or information in an office setting.

Learn More About This Term...

- **11 "C's" of Lean Leadership (+ 5-Page Lean PDF)**

The 11 C's of Lean Leadership provides a mnemonic device you can use to look at a the characteristics of a leader. Review this term online, or download a FREE 5-Page PDF on the 11 C's of Lean Leadership.

Learn More About This Term...

- **14 Points, Deming's**

In his book, **Out of the Crisis**, W. Edwards Deming lists his 14 points for management. The overall aim of the book is to transform the style of American leadership.

At the time the book was first published in 1982, American industry, especially the automotive companies, had started to lag behind Japanese companies in terms of **quality**. Deming spent many years working with Japanese companies, and came up with his 14 points as a way that American companies could transform to be more competitive in the changing global marketplace.

Learn More About This Term...

- **3 Reals**

The '*3 reals'* tie closely to the **concept of *gemba***. The term '3 reals' simply means that you can't learn about something unless you go to the point of impact and look at what is actually happening.

Learn More About This Term...

- **3P / Production Preparation Process**

  The Production Preparations Process (3P) is a powerful means of taking a big-picture look at how a product is designed and manufactured. It guides teams through the creative process of generating ideas, and then whittles the ideas down to one that will be implemented.

  A 3P project can focus on either the **process** or on the product design. The goal is to finish the event, usually about a week long, with a good idea of how the design should look, and a good understanding of how it will be built.

  Learn More About This Term...

- **5 Principles of Lean**

  Lean principles are the guiding concepts that drive the basic behaviors of an organization. While many Lean advocates create their unique set of principles, the most famous were first presented by James Womack and Daniel Jones in their book *Lean Thinking*.

  Learn More About This Term...

- **5 Whys (+6-Page Lean PDF +Video +MP3 +Form)**

  The 5 Whys is a simple problem solving tool that helps you get to the root cause of a problem. Watch a short video, and download a FREE 6-Page PDF on the 5 Whys.

  Learn More About This Term...

- **5 Whys Form (+ Video +Form)**
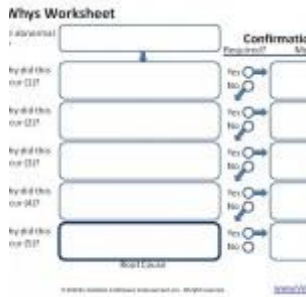
The 5 Whys Worksheet is used to guide a problem solver through his or her root cause analysis.

Format:PPTX

Regular Price: Free for Registered Users

Learn More About This Term...

- **5Ps of Effective Meetings**

The "5Ps of Effective Meetings" is a simple memory device to help you, not surprisingly, run more effective meetings. Because of the increasing complexity of business operations, more and more often, problems require a collaborative solution. Those collaborative solutions tend to require meetings.

Unfortunately, this increased demand for meetings also tends to increase the waste associated with them. And make no mistake; the majority of meetings contain a tremendous amount of wasted time.

Using the "5Ps of Effective Meetings" can help reduce the waste these gatherings generate.

Learn More About This Term...

- **5S (+14 Page Lean PDF, +11 Minute Video)**

An organized, well-designed workplace improves efficiency. A great workplace, goes well beyond simply putting things in designates locations. Visit this Lean term page to learn more and download a FREE 14-Page PDF about 5S.

Learn More About This Term...

- **5W1H**

  5W1H is shorthand for "Who, What, When, Where, Why, and How." It is used both in **problem solving** and in project planning.

  This set of questions is sometimes referred to as the Kipling Method, due to a poem that appeared in Rudyard Kipling's 1902 "Just So Stories."

  Learn More About This Term...

- **6 M's**

  The 6 M's are a mnemonic tool used primarily during the creation of a **cause & effect diagram**.

  The 6 M's are:

  - Machines
  - Methods
  - Materials
  - Mother Nature
  - Manpower (People Power)
  - Measurements

  Learn More About This Term...

- **6 P's**

  The 6 P's are a mnemonic tool similar to the 6M's. Both are used to categorize**causes on an Ishikawa (cause & effect) diagram**. The **6 M's** were traditionally used for fishbone diagrams on the shop floor or other production environments.

  The 6 P's originated when more and more companies began migrating **Lean to the office**. The 6 P's are:

  - Policy
  - Process
  - People
  - Plant
  - Program
  - Product

  Learn More About This Term...

- **6S**

  6S is a mnemonic devices used to recall the 6 steps to improving workplace organization and effectiveness. It is essentially **5S** with **safety** specifically added. The six "S" terms are:

  - Sort
  - Straighten
  - Scrub
  - Standardize
  - Sustain
  - Safety

  Learn More About This Term...

- **7 Basic Tools of Quality / 7 QC Tools**

  The 7 Basic Tools of **Quality** (or 7 QC Tools) is a set of relatively simple data analysis tools used to support quality improvement efforts.

  These tools are fairly simple in that they don't require sophisticated statistics to use (though control charts border on being too complex for the typical user to develop.)

  Learn More About This Term...

- **7 Wastes**

  See also Waste.

  Learn More About This Term...

- **8 Wastes / 8th Waste**

  The 8 wastes are a variation on the seven wastes that were first proposed by Taiichi Ohno, the father of modern Lean.

  The one element that is notably missing from this list is the human factor. For that reason, many people add an eighth waste to the original seven. There are several different versions of this eighth waste, but all focus on wasting the potential or ability of team members.

  Learn More About This Term...

- **80/20 Rule**

  The 80/20 rule states that 80 percent of the effects of something come from 20 percent of the causes.

  The 80/20 rule is also known as the Pareto Principle after the Italian economist, **Vilfredo Pareto**, who first mathematically analyzed the distribution of wealth in his country.

  The 80/20 rule helps prioritize improvement efforts. Working on the critical few (the 20%) causes can yield big gains.

  Learn More About This Term...

- **8D Analysis**

  8D Analysis is a **problem solving** methodology. It takes a step by step approach to identify the **root cause** of a problem and permanently eliminate it.

  Because there is a cost in terms of time and effort in using a formal methodology such as 8D analysis, it is usually only done when there is a project with a large scope or a sizeable risk. Small, low-risk projects tend to require a less structured approach.

  See also: **8D Problem Solving**

  Learn More About This Term...

- **8D for Lean Problem Solving / 8 Disciplines (+Video +MP3)**

  The 8D methodology is a type of problem solving that is similar to the DMAIC approach utilized by Six Sigma. Of note, 8D is a shortened form of the original name, '8 Disciplines'.

  The 8D's are:

  1. Identify the problem
  2. Use a team approach/form an 8D team
  3. Describe the problem
  4. Interim containment
  5. Define the root cause(s)
  6. Develop solution(s)
  7. Implement the solution(s)
  8. Prevent recurrence
  9. Congratulate the team

  Learn More About This Term...

- **9-Square (Prioritization Tool)**

  The 9-square is a prioritization tool in Lean problem solving that helps you organize your improvement ideas. After completing a **brainstorming** session in which you compile a large number of viable options, you have to decide which ones to implement. To use the 9-square, rank each in two categories: impact and ease of implementation.
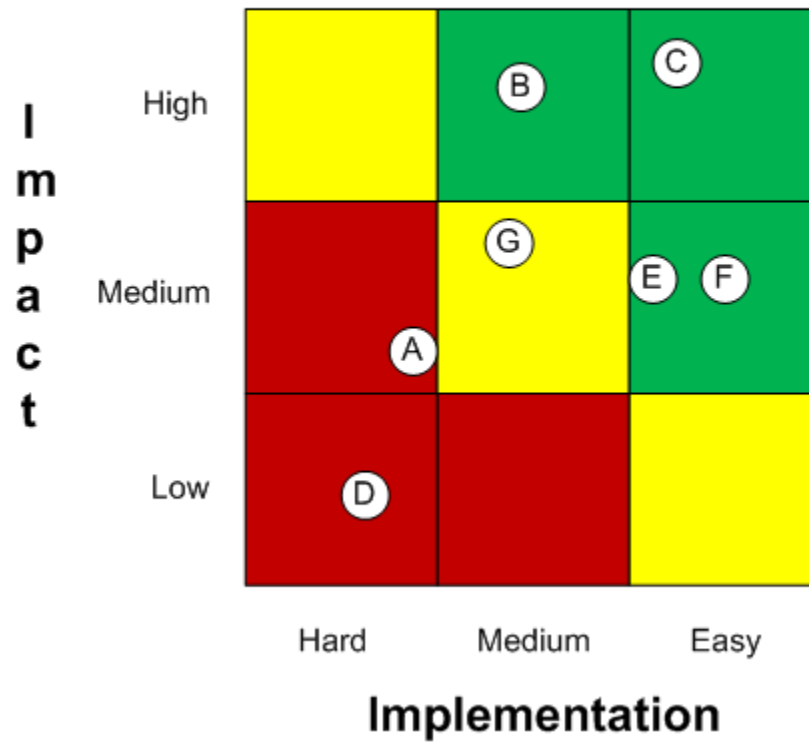
Learn More About This Term...

"A" TERMS

- ## A3 Management

  A3 management is a structured way of running a business. A3 management focuses on using a scientific approach to **problem solving** that creates a learning organization.

  It is imperative that the focus of the problem solving efforts stays on the **process**, and not on people. A3 management requires a level of openness about discussing problems that is hard to achieve. If people on the team feel that A3 management is going to get them in trouble, they will be resistant to answering questions candidly.

  Learn More About This Term...

- ## A3 Problem Solving

  A3 problem solving is a structured approach to resolving **problems**. It was popularized by Toyota, but is now in widespread use.

  A3 problem solving is hard to replicate because it requires discipline to use it and persistence to go through the iterative steps of coming up with a resolution.

  Learn More About This Term...

- ## A3 Process

  The A3 process is a methodology for getting to the **root cause** of a **problem** and addressing it in a way that will permanently eliminate it.

  Following the A3 process entails a large amount of back-and-forth between managers and their teams. For that reason, the A3 process is well-matched to learning organizations— companies that constantly strive to get better.

  Learn More About This Term...

- **A3 Report**

The A3 report is the communication medium of **A3 management**. The A3 report takes its name from the size of the paper, "A3" or 11 x 17 inch, that it is generally written or printed on.

The large size of the A3 report lets users see, at a glance, a great deal of information, including:

- o Header info (**Problem** Title, Owner, Date, etc.)
- o Background Info
- o Current State
- o **Goals**
- o **Analysis**
- o Plan
- o Follow-up

Learn More About This Term...

- **A3 Template (+Video +Form)**

We offer a free A3 template for our registered users. Please keep in mind that this is simply one format. There is no set layout for an A3 report, as they will vary to fit the specific problem.

Format: PPTX (3 layout variations)

Regular Price: Free for Registered Users

Learn More About This Term...

- **A3 Thinking (+14-Page Lean PDF +Video +MP3 +Form)**

A3 Thinking is a focused, structured problem solving methodology. Watch a short video, and download a FREE 14-Page PDF on A3 Thinking.

Learn More About This Term...

- **ABC Inventory**

ABC inventory is a method of categorizing inventory to segment items into different **inventory** management **processes**. Typically, the segmentation is done by calculating out the annual usage of the parts, and labeling the top 70% of parts (by cost) as 'A' parts, the next 25% as 'B' parts, and the final 5% as 'C' parts. On occasion, an organization may include all parts without usage over the last year as another category (i.e. 'D' parts).

Learn More About This Term...

- **Abnormal Conditions**

Imagine you are at home, and you hear a funny sound coming from the washing machine, you smell a slight odor of smoke coming from the kitchen, or you see a water mark on ceiling. Each of these things indicates that something just isn't right. They are abnormal conditions. Sometimes, they tell you that a problem already occurred, but they frequently forecast a pending problem. They let you know that you need to fix something that is about to get worse.

Abnormal conditions exist at work, just like at home. On the job, though, abnormal conditions link tightly to the processes that you do. Each process typically has a range of conditions under which it operates. When something gets out of whack, and an abnormal condition results. When these abnormal conditions exist, it is hard to get consistent outputs.

Learn More About This Term...

- **Abnormality Management**

  There are many different styles of management. One that works well in a Lean environment is abnormality management. In a nutshell, systems are developed that highlight abnormalities. When these **abnormal conditions** are present, leaders and their teams take action to return the situation to **standard**.

  While this sounds simple, the truth is that it is seldom applied effectively, because most organizations do not have clear standards that are consistently followed.

  Learn More About This Term...

- **Absences**

  Absences are, in a nutshell, times when a person is not present to do their normal work. Absences primarily fall into two categories from a production viewpoint—planned and unplanned.

  Your company's HR team may categorize absences in a number of ways, but from the operations standpoint, human resource definitions are irrelevant. It does not matter whether a person is on a **vacation**, medical leave, sabbatical, or suddenly retires. All that really matters is whether the team knows in advance that people will be gone. Obviously, the duration of the planned absence makes a difference in how a team prepares for the absence, but knowing about it in advance gives them an opportunity to take action.

  Learn More About This Term...

- **Acceptable Quality Level / AQL**

  An acceptable quality level (AQL) is the percentage of **defects** allowed for a lot before it is rejected by a customer. Due to the size of most lots and the costs of 100% inspections, the quality of an incoming lot is normally determined by a sampling plan. The AQL will translate into a number of defects that is allowed in a sample of a specified size.

  AQL may be negotiated in a purchasing contract, or it may simply be part of an internal **quality** control process.

  Learn More About This Term...

- **Acceptance Number**

  The acceptance number is the highest number of nonconforming items that can be found in a sample for a lot to still be considered acceptable. This number is determined by statistics and is based on the required quality level, lot size, and sample size.

  Learn More About This Term...

- **Accountability in Lean**

  For **Lean** leaders, both accountability and authority are obviously important. **Authority** is the state of having the power to give directions and make decisions. It is generally is granted by an organization to individuals for the purpose of getting results in the areas they are accountable.

  That's the tradeoff. With the gift of authority comes the burden of accountability–having to deliver good results. Accountability comes from an external person or organization. That simply means that someone else is going to call you on the carpet to explain the results if they are not up to standard. It could be for the performance of a team, or for a continuous improvement project.

  Learn More About This Term...

- **Accounting**

  A company has to know whether what they are doing makes money, right? The people who know how to figure this out are the accountants.

  In the US, accounting is done according to Generally Accepted Accounting Principles (GAAP). This provides a **standard** method of accounting so that when one company says they made 'X' dollars in profit, if can be compared to the performance of another company.

  In order to make sure that everyone is counting the same way, there are several groups that have oversight. The IRS is one. They have their own way of doing accounting, so sometimes companies have different numbers for taxable income that they report to the IRS, and net income that they report to the public (Pratt, 2000, p. 28).

  Learn More About This Term...

- **Accuracy**

  The definition of accuracy is essentially having results (data) that is centered on a target value. Statistically speaking, it is how correct the mean value is. The layman's definition of **precision** is "a measure of how little **variation** there is in your system".

  Lean Six Sigma depends heavily on understanding both of these concepts. When a **process** is not delivering consistently acceptable results, you likely are dealing with either inaccuracy or an imprecise process.
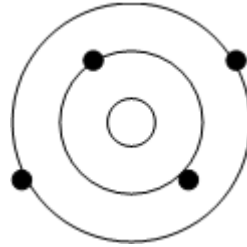
  Learn More About This Term...

- **Action Date**

  Using an 'action date' is a proactive approach to managing your workload.

  Whenever a task is unfinished, there is a next step. Frequently, that step is passively managed. Usually this means waiting for something to happen to allow work to continue. It could be waiting for a part to arrive, or for a customer to call back, or something similar.

  Rather than just leave things to chance, always assign an action date to a delayed task. An action date creates a sense of ownership and active management in people.

  Learn More About This Term...

- **Action Plan**

  Action plans are, in effect, roadmaps to achieve goals. They should contain a description of the improvement **goal**, names of people on the team, steps to be taken, names assigned to the steps, and due dates for steps.

  Some action plans are simple in their layout. Others add in additional features, such as a graphical timeline, a synopsis of the current situation, graphics that show completions progress, and other bells and whistles. Advanced action plans use **Work Breakdown Structure (WBS)**, a **project management** tool, to break projects down into discrete work elements.

  Learn More About This Term...

- **Activity Ratio**

  The activity ratio is a measure of how quickly work moves through a **process**. It is simply the sum of the process times divided by the total **lead time**.

  (Σ Process Time) / Total Lead Time = Activity Ratio

  For example, if the processing time was 30 minutes and the lead time was 2 hours, the activity ratio would be .25 or 25%.

  Learn More About This Term...

- **Activity-Based Costing**

  The definition of Activity-Based Costing: a means of attempting to accurately apply **costs** of running a business to a specific product or service. It entails identifying the 'cost drivers', or the things that drive the consumption of shared resources, and using them to apply a logical proportion of overhead costs to specific products.

  In traditional costing methods, overhead may be applied by a broad brushstroke. All overhead costs may be applied, for example, at the same ratio as the ratio of direct labor costs. The danger of this method is that one product may, in effect, subsidize another product that uses resources in a different manner. In some cases, this may simply skew the understanding of how much**profit** each product contributed. In other cases, the incorrect allocation of costs may actually make an unprofitable product group appear profitable.

  Learn More About This Term...

- **Ad Hoc Query**

  An ad hoc query is simply a one-time request for information from a database. (Ad hoc is Latin for 'for this purpose.)

  Many database reports are standardized and are used repeatedly. They cover the vast majority of typical operations management needs.

  Ad hoc queries, though, play a big role in Lean. Often, the questions that teams have during a *kaizen* event cannot be answered with standard reporting functionality. A common mistake is to try to force that data to match the problem at hand. Generally, this doesn't provide the breakthrough insight that teams need.

  Learn More About This Term...

- **Administrative Processes**

  Administrative processes substantially contribute to a company's **costs**. Obviously, it depends on the company, but estimates commonly attribute 60-80% of expenses to administrative processes.

  Administrative processes are the office tasks that are required to keep a company humming along. Administrative processes include human resources, marketing, and accounting. Basically anything that entails managing the information that supports a business is an administrative process.

  Learn More About This Term...

- **Affinity Diagram**

  One of the more unusually named **Lean tools**, the affinity diagram is not really a diagram at all. It is more of a sorting and grouping process to organize ideas into manageable chunks.

  Learn More About This Term...

- **Agile Manufacturing**

  Agile manufacturing describes a company's ability to be responsive to the marketplace. A company has to be able to roll out new products and services as the needs and desires of their customers change. It also has to offer increasingly varied product mixes and greater customization when customers requires it. Agile manufacturing promotes the belief that these rapid adjustments can be done in a cost effective manner.

  Learn More About This Term...

- **Aha! Moments**

  Aha! moments are the instances when the 'light bulb' comes on. It is the point in time when someone makes the transition from not knowing something to full understanding.

  Fortunately, Aha! moments are often visible on the faces of people experiencing them.

  Why is that relevant you may wonder? Many instructors, especially those mentoring **Lean** students, live for Aha! moments. It is very rewarding to help coach someone to that moment when Lean suddenly makes sense for them.

  Learn More About This Term...

- **Algorithm**

  An algorithm is simply a set of instructions for solving a specific **problem**. It is commonly associated with math or computers, but applies to all problems. A troubleshooting guide is a form of algorithm, as is a recipe. Algorithms make life easier by **standardizing** the method to solve a problem, and help us avoid having to reinvent the wheel every time we encounter some obstacle.

  To truly be an algorithm, the set of instructions must deliver the same results for the same set of conditions, each and every time.

  Learn More About This Term...

- **Allocation (Resource)**

  Resource allocation is simply the art and science of parceling out the various resources available to an organization.

  We use **resource** allocation in our everyday lives-we have to choose how to divide our time, money, and energy. How do we decide? At home, we do it very informally. We often use **gut feelings** to decide if we want a new TV more than a trip to the tropics. Resource allocation, though, even when done informally, is based on goals.

  Learn More About This Term...

- **Alpha Risk**

  Alpha risk is, in statistical terms, the chance of rejecting the null hypothesis when it is, in fact, true. In other words, it is a false positive (i.e. a good part is identified as a defect).

  This risk is also known as a Type-I risk, or producer's risk.

  Learn More About This Term...

- **Alternative Hypothesis**

  The alternative hypothesis is the assumption that there is a statistically significant difference between two sets of data. This is essentially the opposite of the **null hypothesis**. The alternative hypothesis is accepted if the null hypothesis is rejected.

  Learn More About This Term...

- **Ambiguity**

  Ambiguity is the state of uncertainty in meaning. Ambiguity is harmful to **Lean**companies for several reasons.

  - *Ambiguity reduces consistency.* If a *process* is vague, it is hard to follow the same way every time.
  - *Ambiguity slows processes down.* Requesting clarification breaks the rhythm of a process.
  - *Ambiguity misaligns goals.* If everyone doesn't interpret objectives the same way, teams go in different directions.

  Learn More About This Term...

- **American National Standards Institute (ANSI)**

  The American National Standards Institute (ANSI) is a US government organization that coordinates the creation of voluntary national standards. It is the official US representative to the International Organization for Standardization (ISO). More detailed information is available at **www.ansi.org**.

  ANSI works towards promoting national standards. These standards help consumers in the long run, as national standards ensure that competing companies in the same industry are following the same ground rules. Things like crash tests for cars, wind speed ratings for aerial work platforms, and a host of other things are all covered by national standards. ANSI estimates that there were more than ten thousand national standards in mid 2006.

  Learn More About This Term...

- **Amortization**

  Let's say that you and three friends rent a cabin for a week. During that week, you spend a hundred bucks a day on food, entertainment, and the other costs of being on vacation. Is that all you spent? Nope. You still have to account for the cost of the cabin, right? If the cabin cost $840 to rent, you'd take your share of that and add it to the cost of your vacation—an additional $210.

  So, even though, on the first day when you checked in you spent $310 and the rest of the week you spent $100 per day, was the first day really more expensive? If it was, you could just show up a day later and save a lot of money, right? No—one seventh of the value of the cabin is used up each day. So in reality, the vacation cost you $130 per day.

  Learn More About This Term...

- **Analysis**

  Analysis is the deep dive into the details of a **problem** in order to better understand it. Analysis is a central part of most **problem solving** methods. In fact, the 'A' in **DMAIC** (from **Six Sigma**) is *Analyze*.

  Learn More About This Term...

- **Analysis of Variance (ANOVA)**

  Analysis of variance, also known as ANOVA, is a relatively sophisticated statistical modeling technique that looks at variation within and between two or more groups.

  Learn More About This Term...

- **Analytic Hierarchy Process (AHP)**

  The Analytic Hierarchy Process, or AHP, is a decision making tool developed in the 1970's by Thomas L. Saaty. Its key characteristics are that it breaks big decisions into smaller ones, and relies on direct, one-on-one comparisons to make judgments.

  Learn More About This Term...

- **Andon (+7-min MP3, +6-Page PDF)**

  Making a workplace visual is an important part of continuous improvement. *Andon* lights are one method of providing visual warnings that drive action.

  Learn More About This Term...

- **Annual Objectives**

  In the generic definition, annual objectives are simply the company's goals for a calendar year. In most cases these goals should target a degree of improvement.

  In a **Lean organization**, however, there's a much more specific definition for annual objectives...

  Learn More About This Term...

- **Annualized Values**

  Often, something occurs over a short period, but needs to be compared to a full year. This is known as annualizing. An example: You are applying for auto insurance, and the agent asks you what your yearly mileage is. You know that you drove 1,000 miles in the last month. The annualized rate, therefore, is 12,000 miles.

  In continuous improvement, you will likely be dealing with a great many metrics. You will have annual targets—perhaps for dollars of cost savings, number of people trained in *kaizen*, or **productivity** improvements.

  Learn More About This Term...

- **Anomaly**

  An anomaly is a condition outside of the expected range. Generally, an anomaly has an unusual or unexplained circumstance around it. An explainable spike in a pressure gauge is not an anomaly. An inexplicable, temporary increase would be.

  Learn More About This Term...

- **ANSI**

  See American National Standards Institute.

  Learn More About This Term...

- **Apples to Oranges Comparisons**

  Apples to oranges comparisons occur when people examine two objects and draw incorrect conclusions. The problem comes from the fact that the two objects are dissimilar and should not be compared.

  It happens often in **Lean**. Employees resisting Lean may compare the number of machines they run in a Lean company to the number they used to run, and conclude that they are overworked.

  Learn More About This Term...

- **Appreciation (Employee Value)**

  Appreciation is the increase in value of an item over time. In most cases, physical things lose value over time. Clothing, electronic equipment, and most automobiles lose value from the moment they leave the factory. Some items, though, rise in value. One only has to look at an antique shop or peruse a few pages of collectibles on eBay to see this firsthand.

  The common denominator in appreciation is the scarcity of the item…

  [Learn More About This Term...](#)

- **Appreciation for People**

  People crave appreciation for their performance. They put a significant amount of effort into their jobs, and most people closely associate their personal value with how they feel they are perceived at work.

  There are many ways leaders show that they appreciate their team. In some cases, they display their appreciation by presenting the person with something tangible—a bonus, a gift, a plaque. In other cases, mere recognition of the work that they do is enough. It is surprising how often leaders forget to thank people for what they do. Far too often, managers take their people for granted.

  [Learn More About This Term...](#)

- **Artisan Processes**

  An artisan process is one that relies on the skills of workers **over strong processes**. In the past, artisans were held in extremely high regard. This was primarily due, though, to the lack of a reasonable alternative to obtain **high quality goods**.

  [Learn More About This Term...](#)

- **Assembly Lines**

  Henry Ford is generally considered to be the inventor of the assembly line. In reality, he should be credited with the transition of the assembly line into the modern version of it. Primitive versions had been around in England for about a century. Henry Ford's primary improvement was the focus of the *whole* operation around supporting the assembly line.

  [Learn More About This Term...](#)

- **Asset**

  In accounting terms, an asset is an economic resource owned by a company or individual. Assets hold value because of the future benefit they can bring.

  An asset may fall into two categories—tangible and intangible. Tangible assets are what you would expect. Stuff you can touch—buildings, vehicles, machines, etc. Tangible assets are further broken down into noncurrent assets (the stuff mentioned already) and current assets, which typically include **inventory**, cash, and securities (i.e. stocks). Obviously, the word "current" applies to how quickly the asset can be turned into cash.

  Learn More About This Term...

- **Assumptions**

  Assumptions are pieces of information that are presumed to be true, often without any evidence to support them.

  In **Lean**, people often resist changes by presenting assumptions as fact. "Our customers will never go for that." "We need all these parts or the line will shut down." "We can't get those two machines closer."

  Learn More About This Term...

- **Attribute Data**

  All **data** is not created equally. There are many different categories of ways to describe things. Interestingly, there seems to be little consensus on what the terminology means.

  The term "attribute data", if searched for on the web, yields a variety of definitions. Further confusing the issue, some of the data type definitions on one site are called by an entirely different, conflicting, name on another. We've attempted to form a compilation of the different definitions to create a somewhat standardized set of data terms.

  Learn More About This Term...

- **Attribution Theory**

  Attribution theory is the study of the **psychology** behind how people attribute causes to the way they behave and the resulting outcomes.

  There are two types of attribution...

  Learn More About This Term...

- **Attrition**

  One of the imperatives of any **continuous improvement** program is a commitment by the organization to protect jobs. If people don't trust the company, they will be reluctant to do anything that will increase **productivity**. Obviously, if fewer people can do more, then there is a need for fewer people. Companies can **lay people off** as a result of improvement activity exactly once. After that there won't *be* any more improvements.

  Instead, the company's **leadership** should commit to the use of attrition to match staffing to **demand**. This simply means that as people leave the company, they are not replaced. Over time, the headcount will come down.

  Learn More About This Term...

- **Audits**

  The term 'Audit' generally brings up an image of an IRS accountant knocking on the door. Hopefully at your company, audits don't bring about such negative feelings.

  Simply put, audits are checks on things (like **Lean** procedures) that people are supposed to be doing. In most cases, the term 'audit' implies some structure to the check, rather than simply walking around and looking things over (though**leadership** presence like that is important). These types of assessment audits may be of a **process** or system (i.e. quality systems, regulatory compliance, trade-secret protection, etc.).

  Learn More About This Term...

- **Authority**

  Authority is a formally granted power to make decisions. Authority is generally bestowed upon a position rather than a person. It is different than**accountability**.

  For example, a police officer has legal authority while he holds that job. His authority ends when he retires.

  Learn More About This Term...

- **Automated Guided Vehicle (AGV)**

  Automated guided vehicles (sometimes called Automatic Guided Vehicles) are driverless vehicles that primarily perform transportation functions. In most cases, they support materials groups in distribution of raw materials and in movement of finished goods. These vehicles may either operate similar to a pallet jack, and carry the load, or as a tow-truck, and pull the load. They are guided by a variety of means, including…

  Learn More About This Term…

- **Automated Storage and Retrieval System (AS/RS)**

  Automated Storage and Retrieval Systems are systems linked to a computerized control with an automated method of retrieving items from a designated storage location. The principle is that the machine rather than a person does the searching and retrieving.

  Most AS/RS units make significant use of vertical space, leading to a high storage density.

  Learn More About This Term…

- **Automatic Machine Cycle Time**

  Automatic machine cycle time, sometimes referred to as automatic machine time, is the time a machine spends processing a single part without an**operator's** interaction.

  Automatic machine cycle time is critical to the concept of *jidoka*, or separating people from machines.

  Learn More About This Term…

- **Automatic Machine Time**

  See also Automatic Machine Cycle Time.

  Learn More About This Term…

- ## **Automation**

  What is automation? It is the act of adding of a mechanical device to a machine that allows it to operate with reduced, non-continuous input from an operator. This allows the operator to do other tasks while the machine is running.

  In Lean, automation serves the same role it does in any other manufacturing system. It separates people from machines. This allows people to do fewer **dirty, dumb, or dangerous** tasks and helps them be more productive. Automation also powers the **Lean principle** of respect for people. It takes them away from mindless tasks, and lets them work on more interesting jobs.

  [Learn More About This Term...](#)

- ## **Autonomation**

  Autonomation is **automation** with a human touch. It essentially means that an automated machine has the built in intelligence to identify when there is a problem, shut itself off, and signal the operator. This action prevents the machine from damaging itself or from producing more bad parts.

  Autonomation is also known as *jidoka*.

  [Learn More About This Term...](#)

- ## **Autonomy**

  Autonomy is the state of being competent and empowered to make **decisions** on one's own.

  Self-directed or self-managed work teams are examples of autonomous groups. In the most effective application of these sorts of teams, workers own the process, rather than having supervisors or leads giving direction. This responsibility may include **continuous improvement** efforts, **goal setting**, maintenance, problem resolution, production tracking, and other **daily management** issues.

  As a company becomes Leaner, it requires greater levels of autonomous activity from its **frontline employees**.

  [Learn More About This Term...](#)

- **Availability**

  Availability is exactly what it sounds like. It is a state of readiness to perform a task or operation. The term can be applied to a person, process, or piece of equipment.

  Learn More About This Term...

"B" TERMS

- **Back Office / Front Office**

  The terms 'back office' and 'front office' refer to **customer** contact. Those that have direct customer contact are the front office. Others who work in administrative roles are the 'back office'. The terms originally came from the physical layout of an office building, but with the advent of improved communication, the delineation is murkier. Many people now spend all day in contact with customers on the phone and via electronic communication, and hence have many front office characteristics, despite never seeing a customer face-to-face.

  Note that back office work can still be related to individual customers, but may not directly contact them. A person processing loan application falls into this category. Other back office functions, such as engineering and HR indirectly support customers in the aggregate.

  Learn More About This Term...

- **Backflush**

  Backflushing is an accounting method that can also be used to manage inventory. It is also known as "postproduction issuing." When an item is purchased by a customer, the appropriate materials and other resources are issued to the order. The **inventory levels** in the system of all components on the bill of materials are also reduced. When the inventory reaches a prescribed level, an order is placed.

  Learn More About This Term...

- **Backsliding**

  Backsliding it the act of reverting to a **pre-improvement process**.

  If you were to plot improvement **over time on a run chart**, backsliding would give the curve a saw-tooth look to it. A gain followed by a drop, followed by a gain and another drop.

  Learn More About This Term...

- **Backups (Employee)**

  Employee backups are the people who fill in when the regular operator is absent.

  Having backups implies something. It means that the team has regularly assigned positions and does little or no **job rotation**.

  In great **Lean** companies, **standard work** is in full force and people rotate in and out of positions regularly. This reduces the need for backups because there are already many people **cross–trained** for each work area.

  Learn More About This Term...

- **Baka Yoke**

  Baka yoke is the Japanese term for 'foolproofing' or 'idiot proofing'. Needless to say, it is not the most politically correct of terms, and has been replaced in common use by *poka yoke*, or 'mistake proofing.'

  The principle is the same for both terms. Prevent mistakes rather than correct defects. The subtle difference between *baka yoke* and *poka yoke* is that the focus changes from the person (fool or idiot) to the process or action (mistake).

  Learn More About This Term...

- **Balanced Scorecard**

  The Balanced Scorecard is a management tool developed by Robert Kaplan and David Norton and published in their book titled ***The Balanced Scorecard***. The book focuses on four areas:

  - Financial performance
  - Customer knowledge
  - Internal business processes
  - Learning and growth

  The term 'balanced', as explained in their preface, is many faceted. It compares short and long term, financial and non-financial measures, lagging and leading**indicators**, and external and internal performance. The authors stress that the balanced scorecard is a management system, not a measurement system.

  Learn More About This Term...

- **Bar Charts**

Bar charts are generally used to differentiate between the values of a parameter for 'buckets' of **data**. The length of the bar shows the relative value of that data point.
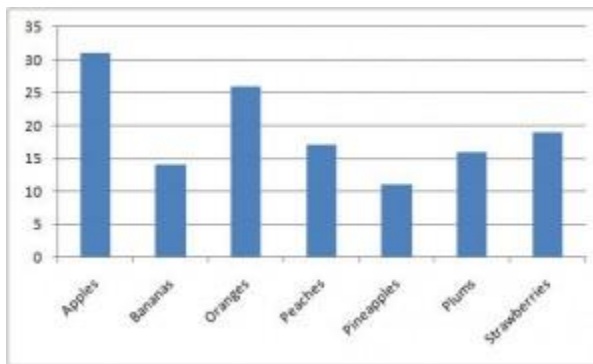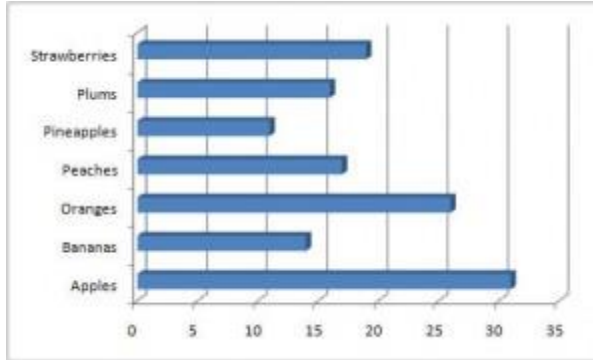
That just means that the bars represent a group, such as types of fruit in these examples, and the longer the bar, the higher the number. The parameter can be anything—number sold, acres planted, or people choosing it as their favorite fruit.

Learn More About This Term...

- **Barrier to Entry**

Barriers to entry are the variety of factors that keep new entrants from competing in a particular industry. It may be the strength of the **brands** of the incumbents. It may be the cost of developing competing technology. It may be access to raw materials or distribution channels. It may even be perceived loyalty of major **customers**. The equipment needed to manufacture the products may be prohibitively expensive.

Whatever the reason, whether real or imagined, companies must take the factor into consideration when deciding on their strategy. If the **cost** of competing is too high, they are unlikely to enter the market.

Learn More About This Term...

- **Barriers to Flow**

  Most **continuous improvement** efforts, either directly or indirectly, are centered on improving **flow**. Flow is the condition where work moves from one process to the next without stopping. Improving flow means taking out all the efficiencies that keep that continuous movement smooth and direct.

  When flow doesn't exist, it is not because it is unwanted. Even the most **batch-oriented manufacturer** would prefer flow, but they see many reasons why flow is not practical. These reasons—the things, both real and imagined, are known as barriers to flow.

  Learn More About This Term...

- **Baseline (Baseline Measures)**

  A baseline is a snapshot of the state of a process or operation prior to making improvements. In effect, it is the 'before' measures of a process.

  Learn More About This Term...

- **Batch and Queue**

  In traditional manufacturing, there is a tendency to run large lots, or **batches**. This occurs for a variety of reasons—large distances between **processes**, long setup times, or simply poor processes.

  When the batch is transferred to the downstream **process**, it sits in line, the 'queuing' part of batch and queue.

  Learn More About This Term...

- **Batch Manufacturing (+Video)**

  Batch manufacturing is the 'traditional' form of manufacturing where**production** is completed in lots of various size, and the lots are passed along en masse to the next step. Typically, layouts in batch manufacturing are done by function—a weld shop, a paint shop, a fabrication shop, etc.

  Another name for batch manufacturing is 'batch and queue'. It gets this name for obvious reasons. Products are produced, and then are shipped to the next process, where they sit in line waiting to be worked on.

  Learn More About This Term...

- **Batches**

  Batches are groups of products that go through a **process** together. Batches work against the **Lean** principle of **flow**, because the first parts that are produced have to wait until the rest of the parts are completed before they can all move to the downstream process.

  Batches tend to drive up inventory. It is rare that the batches meet the exact needs of the downstream process, so the completed work sits until it is used.

  [Learn More About This Term...](#)

- **Bells and Whistles**

  "Bells and Whistles" are the extras on a product…or on a **process**.

  On a product, bells and whistles are the features that enhance the product, but don't significantly change the function. Years ago, power windows were part of the bells and whistles packages that carmakers used to distinguish cars from their competitors. Nowadays, backup sensors and blind spot detection are the extras.

  Bells and whistles often drift from extras to essentials as **Lean customers** come to expect the item and every competitor offers them.

  [Learn More About This Term...](#)

- **Benchmarking**

  Benchmarking is simply the practice of finding someone who does something well and using it as a reference to gather set the bar for improvement. This can be done within the same industry (i.e. comparisons to competitors), or in other industries to spur revolutionary thinking.

  One frequently overlooked opportunity for benchmarking is within the same company. This may be under the same roof (accounting has found a great way to tag files on their hard disks), or in a separate division. With the rampant acquisitions going on today, many companies now have numerous organizations in their own ranks that they can benchmark.

  [Learn More About This Term...](#)

- **Best Practices**

  The term 'best practice' is commonly used to describe a standout **process** that is the best *known* way to do something. 'Best practice' is really a misnomer. There is no such thing as a 'best' practice—only a 'best known practice'.

  The term itself goes contrary to the whole premise of **continuous improvement**—that things can always be made better. Don't let yourself get complacent because you come up with a 'best practice'.

  Learn More About This Term...

- **Beta Risk**

  Beta risk, statistically speaking, is the risk associated with accepting a null hypothesis when it is actually false. In other words, beta risk is a false negative in which a product is said to be free of defects when it actually has one.

  Beta risk is also known as a Type-II error, or consumer's risk.

  Learn More About This Term...

- **Better, Not Perfect (+ 5-Page Lean PDF)**

  When resources are limited, getting better is more important than becoming perfect. It takes a lot of resources to get close to perfection, and most companies still have a lot of other opportunities in areas that are not yet even good. Allocate resources wisely.

  Learn More About This Term...

- **Bias (In Data Collection)**

  There are two ways to look at the term 'bias'. Let's start with the technical, statistical way. It is the systematic **error** component, or the difference between what the observed average is and what the actual average is. That just says, in a fancy way, that your sample or **observation** matches reality.

  In some cases, you recognize that your system has bias. You might identify a problem where a measuring device reads **consistently** off. Perhaps you have a stop on a cutting device that has shifted, so the ruler adds a quarter inch to each piece that you are cutting. Or you might have a tape measure where the little metal tab is getting loose—and adds an eighth of an inch to every measurement. This is most commonly identified when another instrument that is accurate measures the same item and a discrepancy is noted.

  [Learn More About This Term...](#)

- **Birdcage**

  The term 'Birdcage' has two basic meanings in **continuous improvement**.

  The most common usage applies to when a work area encloses a person, trapping them inside. It is usually commonly applied to manufacturing areas where material racks and workbenches isolate a person, but cubicles act in a very similar way. They separate people from each other, and raise the **cost** of dealing with problems dramatically. They also serve as a barrier to **communication** and teamwork.

  [Learn More About This Term...](#)

- **Black Belt**

  There are a variety of 'ranks' in **continuous improvement** environments. The belt system originated with **Six Sigma**, but has spread to **Lean**. Typically, Green Belts are people who have been trained in a general manner to do basic projects. Black Belts have more expertise, and are capable of coaching and mentoring teams. Master Black Belts are the top experts who have the skills to 'train the trainers' and create more Black Belts.

  Many companies that issue certifications. Some certify internal employees only in support of their own business. Other certifications come from third parties that specialize in **training**.

  [Learn More About This Term...](#)

- **Blitz, Kaizen**

  A blitz is an intensive project, typically a week long, with focused gains in mind. The term *kaizen* or *kaizen* event are sometimes used interchangeably with blitz.*Kaizen*, in a broader sense though, is any effort to make something better. It makes for a bit of confusion about whether you are talking about a structured event or just a general improvement effort.

  Learn More About This Term...

- **Boredom**

  Boredom, not surprisingly, is simply tedium or a lack of excitement in your job. Boredom (or lack thereof) plays a big role in **job satisfaction**. Nobody wants to go to work and face eight or ten dull, monotonous hours of every day.

  A lot of people fail to recognize is that there is significant **waste** associated with boredom at work. Bored employees may get the job done, but they are not as**effective** and **productive** as they could be.

  Learn More About This Term...

- **Bottlenecks / Capacity Constraints (+MP3)**

  The term 'bottleneck' (**capacity** constraint) comes from the area at the top of the bottle that limits the **flow** coming out. It doesn't matter how big the rest of the bottle is—liquid will only flow out as fast as the size of the neck will allow.

  That is stating the obvious, but the concept holds true in any production environment, whether in the office, or on the manufacturing floor. There is one**process**, station, step, etc. that is the limiting factor that will prevent greater throughput. This is the rate limiting step that determines your capacity.

  Learn More About This Term...

- **Bowling Chart**

  "Bowling chart" is the nickname given to the tracking sheets used to monitor either KPIs or **policy deployment** objectives. Its name comes from the similarity to a bowling scorecard. You may also hear the term "bowler" used to describe these forms.

  The form compares the targets (plan) to actual performance on a monthly basis.

  Learn More About This Term...

- **Brainstorming Techniques**

Brainstorming techniques have varying degrees of structure, but they are all used to generate ideas.

Brainstorming techniques include:

  o A brainstorming session in which everyone in the room blurts out ideas.
  o A brainstorming session that takes a round-robin approach, with each person presenting an idea in turn.
  o A brainstorming session in which each person writes out a specified number of ideas.
  o A session in which each person brainstorms a specified number of drawings of an idea.
  o A brainstorming approach in which ideas are passed around the room with each person building on previous ideas.
  o Brainstorming in the context of another tool, such as filling out a **cause and effect (Ishikawa) fishbone diagram** or an **affinity diagram**.

Learn More About This Term...

- **Brand**

This may seem obvious, but a brand is the identifier that lets **customers** know which product they are buying. It distinguishes between the products of different companies. In many cases, brands are trademarked. To prevent confusion with consumers, other companies are not allowed to use the same, or even confusingly similar brands. Makes sense, since companies spend a huge amount of money developing their brand, and don't want the competition to reap the rewards.

Brands are supported by many forms of marketing. Many people can recall the 'Tastes great-Less filling' ad campaign. The logos of many companies are immediately recognizable, such as the red background and white script of Coca-Cola® or the Pepsi® ball. Jingles also support brands. Oreo® and Oscar Mayer® both used lyrics that were sung by millions.

Learn More About This Term...

- **Break-Even Point**

  The break-even point is, not surprisingly, the point (number of units sold) where the company can "break-even" and start earning profit.
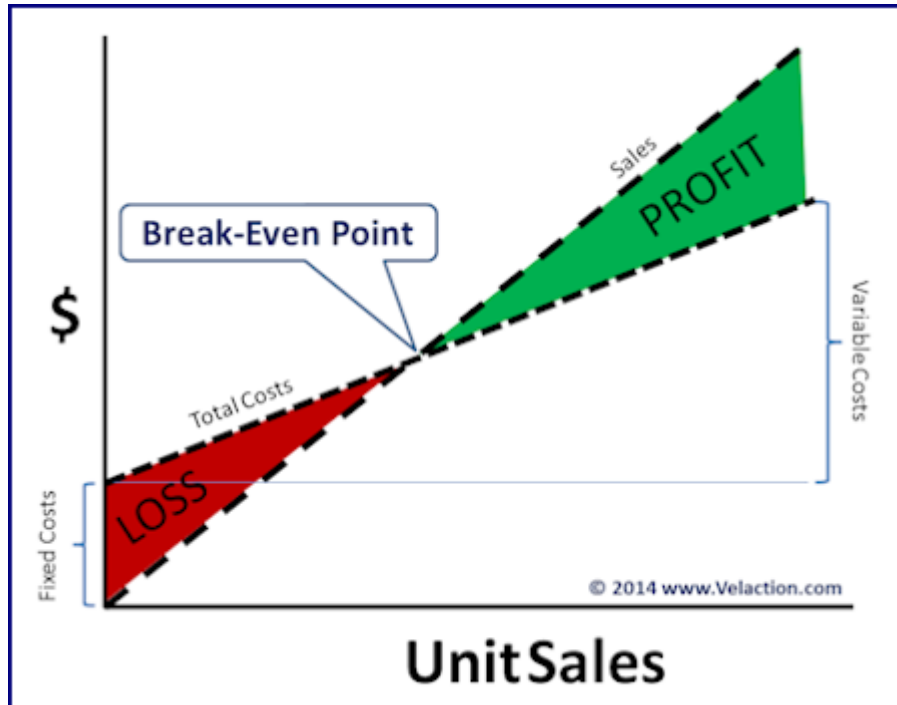
  Learn More About This Term...

- **Breakthrough Objectives**

  Breakthrough objectives are targets that can only be achieved with significant changes to the way the company operates. A company cannot achieve them by doing business as usual. Breakthrough objectives often cascade down from an aggressive strategic plan.

  Sometimes a breakthrough objective is established based on an opportunity. For example, a new vice-president with previous Lean experience may be set an aggressive goal to dramatically reduce finished goods **inventory** and do more make-to-order production.

  Learn More About This Term...

- **Briefback**

  The process of giving instructions often leaves a significant amount of room for misinterpretation. People are often distracted during the briefing, or skim the email containing instructions. Or, the recipient may just make some different**assumptions** than the person delivering the instructions. Regardless, as in the childhood game of 'telephone', the message's intent can be distorted.

  Learn More About This Term...

- **Buffer (Production)**

  A production buffer is a **type of inventory** allocated specifically as a hedge against **variation**. The **root cause** of the unpredictability may be due to the normal variation of a process, or any of a variety of types of special cause variation. The latter causes include things like supplier unreliability, machine breakdowns, and **high defect rates**.

  Learn More About This Term...

- **Buffer Time**

  Buffer time, in project management, is the extra time added into a time estimate to keep a project on track.

  There are two general types of buffer time.

    o   Project buffer time
    o   Task buffer time

  Project buffer time is the time that is added to the end of the project (or at various critical points along the way) that is managed by the project manager.

  Learn More About This Term...

"C" TERMS

- ## C-Level Executive

  C-Level executives are the top individuals in an organization's hierarchical structure. They most common are the CEO (Chief Executive Officer), CFO (Chief Financial Officer), and COO (Chief Operating Officer). There are also frequently c-level executives in charge of marketing or information technology.

  Learn More About This Term...

- ## Calibration

  Calibration is the process of comparing the measuring capabilities of a piece of equipment to a known standard. In the common vernacular, calibration is thought to include adjustment as well. In reality, calibration and adjustment are two separate processes.

  Learn More About This Term...

- ## Call Center

  Call centers are simply clusters of people answering phones for a particular purpose. It might be to provide **information**, as in a hotline for a recall. It could be for placing orders, for technical support, or for customer service. Call centers can be inbound, where customers are calling in, or outbound, where the organization is calling the customer, such as for sales, or to promote political candidates.

  Learn More About This Term...

- ## Capability

  Capability simply means that a person or machine has the ability to perform a required task. It is a binary measure. That simply means that it is physically possible in the current state to do something.

  Learn More About This Term...

- **Capacity**

  Capacity is the amount a given group, team, or individual can produce. It is determined by factors such as **productivity**, staffing, hours of operations, equipment limitations, **defects**/scrap, **setup time requirements**, number of shifts, equipment maintenance requirements, and a host of other factors.

  Learn More About This Term…

- **Capital Expenses**

  Capital expenses are the **cost** for fixed assets—the things that are typically carried on the books (reported on financial statements), last longer than a year, and provide recurring value.

  Buildings, vehicles, and equipment are typically capital expenses.

  Learn More About This Term…

- **Card, Kanban**

  See also *Kanban* card.

  Learn More About This Term…

- **Catalog Engineer**

  "Catalog engineer" is a derisive term used to describe someone with a lack of**creativity** when it comes to **process improvement**. The term describes those who immediately attempt to purchase an existing solution to a **problem** rather than try to figure out a method in-house.

  Learn More About This Term…

- ## **Catchball**

    Catchball is a business process of floating ideas and comments around in an iterative manner. The name 'catchball' comes from the metaphor of tossing an idea back and forth, much like you might with a football.

    In Lean, the catchball process…

    - refines ideas
    - promotes buy-in from the **front line**
    - encourages **creativity**
    - helps create a **continuous improvement culture**.

    Learn More About This Term…

- ## **Cause and Effect / Fishbone Diagram (+ 11-Page Lean PDF, + Video, + Form)**

    Effective problem solving requires an arsenal of tools. The cause and effect diagram is an effective way to sort through the chaos and see what is really causing your problems. Visit this Lean term page to learn more and download a FREE 11-Page PDF about fishbone diagrams.

    Learn More About This Term…

- ## **CEDAC**

    CEDAC is an acronym that stands for cause and effect diagram with the addition of cards. It is a very specific way of building a fishbone diagram in which team members contribute ideas written on 3 x 5 cards or Post-it notes.

    CEDAC is a **problem-solving tool** (video available) that relies on **brainstorming**. The goal of CEDAC is…

    Learn More About This Term…

- **Cell, U-Shaped**

  See also U-Shaped Cells.

  Learn More About This Term...

- **Cell, Work**

   See also work cell.

  Learn More About This Term...

- **Cellular Manufacturing System**

  In general, **batch manufacturing** (the opposite of a cellular manufacturing system) is oriented around a **process**. You might have a cutting group, a welding group, a grinding group, etc. Each **workgroup** is structured based on what they do. These clusters of machines produce long runs of a product according to a work schedule and deliver piles of **work-in-process** to the next operation in the **value stream**. Note: To clear up a confusing point, these process based groups are often referred to as 'cells'. This process based 'cell' does not make the company a cellular manufacturing.

  Learn More About This Term...

- **Central Limit Theorem**

  The central limit theorem, in layman's terms, says that regardless of the shape of the underlying distribution, in most cases, the **mean** of samples taken from the distribution will approximate a normal distribution.

  Learn More About This Term...

- **Chaku-Chaku**

  A *chaku-chaku* line has a series of machines, each equipped with a *hanedashi* device, or autoejector. This enables the **operator** working a *chaku-chaku* line to

  - walk up and immediately insert the part he is holding into a machine
  - press a start button, and then
  - pick up the previously ejected part.

  Because the *chaku-chaku* operator is running several machines, she relies on *jidoka* (autonomation). If there is a problem on a machine while the operator is away, *jidoka* stops **production**, preventing further **defects** or damage to the machine.

  Learn More About This Term...

- **Champion**

  A Lean champion tends to be project oriented. They are **senior executives** with clout in the company. They provide backing to the project team and help remove obstacles, provide resources, move things along more quickly, and resolve disputes.

  Learn More About This Term...

- **Change Agent**

  A change agent is simply an advocate for change, who follows up on those convictions. He or she not only expresses a desire for change, but also attempts to rally those around them to join the cause. While change agents can be of any rank, they must have influence to make an impact on those around them.

  Change agents work best from within the company. Frequently, companies will hire a speaker, or a consultant to help drive change. While this supports the process, it is no substitute for having a management team that is committed to a vision and is helping steer the company towards improvement.

  Learn More About This Term...

- **Change Management (+ 9-Page Lean PDF)**

Making improvements, by definition, requires change. Since most people find change very challenging, change management is an essential skill for leaders to have in any Lean organization.

[Learn More About This Term...](#)

- **Change Resistance**

The term 'resistance to change' is commonly used in **discussions about Lean**. It simply means that people are set in their ways, and often don't want to modify their routines.

Surprisingly, this change resistance doesn't just occur when people who like their jobs are asked to make a change. Resistance even comes from people who are chronically upset with their working conditions. For them, the known evil is preferable to the unknown.

[Learn More About This Term...](#)

- **Changeover**

  Changeover is the time it takes to go from the last good part of one product run to the first good part of the next product run. Quick changeover is critical to Lean. It provides the flexibility to match the product mix to actual demand.

  In turn, this prevents the accumulation of inventory that can add cost and substantial waste to a value stream.

  Watch out for a terminology issue with changeover. **Setup** and changeover are sometimes used interchangeably; in other cases, setup is viewed as a component of changeover. In that usage, it refers to the part of changeover that is focused on configuring a machine for a different product type.

  Learn More About This Term...

- **Chart, Process Flow**

  See also Process Flow Chart.

  Learn More About This Term...

- **Chart, Run**

  See also Run Chart.

  Learn More About This Term...

- **Check Sheet**

  Check Sheets are means of tallying data. They generally are kept at the point of **data collection**, and every time a particular incident happens, a check is placed in the appropriate box.

  In many cases, the check sheet will be broken down into a grid. The columns most often contain the different types of occurrences. The rows are broken down into time periods, whether hours, days, or a longer period.

  Learn More About This Term...

- **Checklists (+ 9-Page Lean PDF)**

Checklists are a quick, effective way to improve a process. There are pitfalls to using checklists, though. Visit this Lean term page to learn more and download a FREE 9-Page PDF about using checklists effectively.

Learn More About This Term...

- **Checkpoints**

Checkpoints, in the military, are used to track progress of a unit's movement.

In **Lean**, checkpoints can be used in a similar fashion. Checkpoints can be linked to specific **process** steps. When the sequence of work is **standardized**, the operator should hit those checkpoints with the same time remaining in the *takt* **time** each and every cycle.

Learn More About This Term...

- **CLOSED MITT (+ 5-Page Lean PDF)**

CLOSED MITT is an acronym that is useful for helping to identify and categorize waste, and ultimately eliminate it.

Learn More About This Term...

- **Coaching (+ 3-Page PDF)**

Coaching is an integral part of leadership, and as such it is essential in a Lean environment. Visit this Lean term page to download a FREE 3-Page PDF about coaching.

Learn More About This Term...

- **Common Cause Variation**

Common cause variation is the predictable, repetitive, systemic portion of variation. Contrast this with special cause variation, caused by unusual occurrences.

Common cause variation, in a nutshell, is the consistent **randomness** built into a **process**. It is also frequently referred to as 'noise.'

Learn More About This Term...

- **Communication (+ 6-Page PDF)**

Communication is the act of passing information back and forth. It is important not only to Lean operations, but also plays a vital role in creating employee satisfaction. Visit this Lean term page to download a FREE 6-Page PDF about communication.

Learn More About This Term...

- **Competition**

  Competition is the act of trying to get your needs met over the needs of someone else.

  It could be competing in sports (your need to win over their need), in a job hunt (you against the thousand other applicants). Or it could be in a marketplace (trying to fight it out of for the same pile of money).

  [Learn More About This Term...](#)

- **Competitive Advantage**

  A competitive advantage is a condition through which one organization has to spend fewer resources to get the same benefit **as a competitor** (or, of course, gets more benefit for spending the same amount of resources.)

  [Learn More About This Term...](#)

- **Complacency**

  Complacency is the state of being content with achievements while simultaneously being unaware of the pending dangers.

  One of the greatest risks successful **Lean** companies face is complacency. They make massive gains, and become highly **competitive** in their markets. Then they become complacent and rest on their laurels while the competition makes progress.

  [Learn More About This Term...](#)

- **Complexity**

  What's the definition of complexity? It is anything that has a lot of intricacy to it. The word has a negative connotation to it in **Lean**. So what is complexity from a Lean perspective? It is adding more to a **process** than is needed. It is adding 3 steps when 2 will suffice. Keep the acronym KISS ('Keep it simple, stupid') in mind when developing Lean processes. It is a reminder to avoid complexity.

  In general, the more complex a solution or process is, the less likely it is to be followed, and the more likely it is to break, leading to poor **quality**.

  [Learn More About This Term...](#)

- **Compromise**

  A compromise involves mutual concessions by both sides during a disagreement. A compromise is characterized by each party getting *less* than they originally wanted in order to reach an agreement.

  Compare compromise to collaboration and **cooperation** where two parties work together to achieve common (or overlapping) goals. In those types of arrangements, unlike in a compromise, both parties can come out *ahead* of where they originally were.

  Learn More About This Term...

- **Computers**

  Not that many years ago, people could choose not to use computers. In fact, many people did not have access to a computer at home or at work.

  According to a **Research and Markets report**, as of January of 2009, 80% of US households have a computer. Many of the last 20% likely have access to a computer some other way—through work or via a friend or relative.

  Learn More About This Term...

- **Concrete Head**

  A concrete head is someone who is resistant to the changes that Lean brings. Obviously this is a derogatory term. The term "concrete head' is the result of a translation from Japanese.

  Learn More About This Term...

- **Conflicts**

  Conflict is the state of disagreement or opposition.

  Conflict is a normal part of any **Lean** effort. When a **process** is changed, people invariably have differing opinions about the best way to fix things. In some cases, there is even conflict about whether something is even a **problem**.

  Learn More About This Term...

- **Confusion**

  Confusion is a lack of certainty. This uncertainty translates to **waste**.

  This waste is cause by two main things:

  1. **Delays:** Confusion creates delays in **processes** when operators try to figure out what to do, which leads to variation in **cycle time**. With enough of these delays, lead times also become harder to predict.
  2. **Poor Quality:** Confusion creates **quality** problems. When instructions are unclear, people sometimes get the process wrong.

  Learn More About This Term...

- **Consistency**

  The definition of consistency (for Lean) is the ability to repeat a process over and over, and get the same results every time. Although it is not exclusively a Lean term, consistency is a critical component of Lean Standardized Work (frequently called Standard Work).

  Why is it important to continuous improvement? Consistency in processes is the reason that continuous improvement works at all. That stability provides a foundation upon which to make improvements.

  Learn More About This Term...

- **Constraints**

  Eliyahu Goldratt put together his Theory of Constraints, and presented its principles in his book 'The Goal'. He explains that systems generally have a single (sometimes more) **bottlenecks** that limit, or constrain, production.

  In a more general sense, a constraint is anything that prevents you from accomplishing something that you want to do? Constraints come in a variety of forms. Laws (like speed limits), regulations (like those that OSHA administers), and **customer** preferences are all constraints.

  Learn More About This Term...

- **Containment**

  Containment is an interim quality management step. When a problem is identified, the organization must take steps to prevent defects from escaping. Containment is a method of systematically identifying and quarantining all materials that are suspect until they can be confirmed not to contain defects.

  Learn More About This Term...

- **Continuous Data**

  Continuous data can have any value within a given range. Compare this to discrete data which is limited in the values it takes.

  Learn More About This Term...

- **Continuous Flow**

  Continuous flow is the act of moving a product through the production process from start to finish without stopping. In pure continuous flow, the cycle time equals the lead time, as the product never sits in a queue waiting to be worked on.

  Contrast this to **batch and queue** production in which larger groups of parts move as a unit and then wait for an operator to have time to work on them.

  Learn More About This Term...

- **Continuous Improvement**

  Continuous improvement is the art of relentlessly attempting to make **processes** better. It is an all-the-time thing. It includes both the reduction of **costs** (primarily through waste reduction), or the increase of sales by offering better products and services. Regardless, it is the mindset that j**ob satisfaction** should come from improving one's environment.

  Continuous improvement has this basic tenet: *you are never done making things better*. As soon as something is implemented, there is already an opportunity to improve it. There is no such thing as **perfect**, and there is no best way to do something. There is always, always, always a better way.

  Learn More About This Term...

- **Continuous Improvement Culture**

A *'continuous improvement culture'* is a shared value system that promotes the belief that what is good enough today is not good enough for tomorrow.

Cultures do not change overnight. It takes time, patience, strong**communication** skills, and most importantly, trust between **managers** and their**teams**.

Learn More About This Term...

- **Contract (of Change)**

Frequently, people will have their teams sign a 'change contract' that clarifies what their role is in whatever project or initiative they are taking part in. For some reason, when people sign their names to something, they are more likely to follow through on it. These contracts generally include actual behaviors, as well as attitudes.

Learn More About This Term...

- **Control (DMAIC Step)**

The control step of the **DMAIC** process is where changes are locked in place. The control step requires a system to measure the performance of the new**process** to ensure it is performing as expected.

Learn More About This Term...

- **Control (Scientific)**

A control, or control group is a tool used to confirm whether changes are actually having an effect. The control group is exposed to the same conditions as the test group with the exception of the variable that is being examined.

Learn More About This Term...

- **Control Limits**

Control limits are lines established 3 standard deviations from the **mean** on a**control chart**. Keep in mind that the control chart depicts averages, so exhibits a normal distribution. (See **Central Limit Theorem**) 99.7% of all random variation (**common cause**) will fall within the upper and lower control limits. Outliers can generally be assumed to be outliers, indicating that the process is**out of control**.

Learn More About This Term...

- **Control, Statistical**

  When a **process** is said to be 'in control', statistically speaking, that means that **all the variation** can be attributed to **common causes**. All of the observed variation is just a function of the **natural randomness** built into a system or process.

  Learn More About This Term...

- **Control, Visual**

  See also Visual Control.

  Learn More About This Term...

- **Conveyors**

  Conveyors are automatic systems for moving products and materials between two points. Roller tables perform the same function, but without the automation. Some are built on the ground; others are elevated to bench level. Some even hang parts overhead.

  While conveyors certainly have an application in many situations, **Lean** tends to look to other solutions first. Lean's use of work cells and flexible stations, as well as the constant rearranging of **processes** can make conveyors impractical.

  Learn More About This Term...

- **Cooperation**

  Cooperation is the act of tailoring your activities to work with someone else's in order to achieve a specific **result**.

  Cooperative relationships are generally informal. They tend to be successful because there is overlap in what both parties want to achieve-the intersection of both of their **goals**. While all parties have their own agendas, there is enough commonality to make the relationship beneficial for everyone.

  Learn More About This Term...

- **Corrective Action Report (CAR)**

  A Corrective Action Report (CAR) is a tool used to support a quality program. It is a written record of the investigation into the **root cause of a problem** and the actions that are required to permanently eliminate the underlying issue.

  Learn More About This Term...

- **Correlation**

  Correlation is a statistical term that describes the relationship between two different, measurable factors. The relationship may be positive (same direction—one goes up, the other goes up, like temperature and the number of people on the beach), or negative (like temperature and the number of people wearing coats).

  The relationship will have a mathematical formula associated with it, but it may not be a linear link. Changing one variable may do wacky things to the other. Some of the relationships can be rather **complicated**.

  Learn More About This Term…

- **Cost of Poor Quality (COPQ)**

  The cost of poor **quality** (COPQ) is the aggregate impact of an organization's **errors** and **defects** on the company.

  It includes costs associated with scrap, **rework**, **inspection**, data management, **data collection**, redesign, warranty claims, lawsuits, lost sales, loss of reputation, additional **inventory**, and any other expense that is incurred to make sure customers are not stuck with products that don't work.

  Learn More About This Term…

- **Costs**

  Costs are simply our outlays or expenses for which we get something in return. It is most often money, but it can be anything—time, money, or even something that you trade in barter.

  That expectation of getting something in return, given the assumption of a rational market, always implies a win-win situation. In a voluntary transaction (I'm leaving things like taxes and fines out of this), both sides think that they are getting more value than they are giving, or else the exchange doesn't make sense to do.

  Learn More About This Term…

- **Counterclockwise Flow**

Many Lean experts advocate setting up work areas so there is counterclockwise flow. This principle goes hand-in hand with the **U-shaped cell**. Using a counterclockwise flow comes from the fact that most people are right-handed. As they move through the cell, their dominant hand is closer to the work sooner.

While it seems on the surface that this might not save much time, the seconds add up quickly in a fast-paced work area. It also appeals to people ergonomically, as there is less twisting and turning at each station.

Learn More About This Term...

- **Countermeasure Sheet**

We offer a free countermeasures form for our registered users. Use it as part of your monthly operations review package.

Format: XLSX   **Regular Price:** Free for Registered Users

Learn More About This Term...

- **Countermeasures**

Countermeasures are the actions taken to reduce or eliminate the **root causes** of problems that are preventing you from reaching your goals. In many cases, this is a formal **process** for a company. A company does its strategic planning, which cascades down through the levels of an organization, creating targets, or Key Performance Indicators (KPIs). When the organization is missing on one of its KPIs, its leaders should perform countermeasures to make sure they have a plan to get back on track.

Countermeasures are also done when a problem 'pops up'. But I encourage you to look at what **metric** that problem links to. You'd be surprised how often these sorts of issues can be tied to company targets.

Learn More About This Term...

- **Creativity**

  Creativity is the ability to break the mold of traditional thinking.

  Most people think of creativity as the ability to come up with new ideas. But creativity is also exhibited when people use existing **information** in new ways.

  Learn More About This Term...

- **Credibility of Lean**

  Credibility is trustworthiness. Credibility comes from a track record of getting things right.

  Lean, despite its global success, has to earn its credibility within a company. It is not enough for a **leader** to talk about the virtues of Lean, or to point to external examples. Employees have to see a record of success on their home turf for them to start seeing Lean as a viable solution.

  Learn More About This Term...

- **Critical Few**

  The critical few are the minority of causes that contribute to the majority of the effects. The critical few is the '20' part of the **Pareto Principle**, otherwise known as the 80-20 rule.

  Addressing the critical few has the potential to provide the biggest bang for the buck. In most cases, you can conserve your **continuous improvement** resources by concentrating them on the critical few.

  Learn More About This Term...

- **Criticism**

  Criticism is negative feedback about something. At work, criticism can be about personal performance or a process.

  In a **Lean** culture, discussing problems is an essential part of making improvements. The key to success at addressing these issues is to make every attempt to separate the failure of a person from the failure of a **process**.

  Learn More About This Term...

- **CRM / Customer Relationship Management**

  CRM stands for customer relationship management. It essentially is the practice of taking an active approach to understanding how a company interacts with its**customers** and creating a strategy to manage that relationship for both current and future customers.

  Learn More About This Term...

- **Cross-Functional Team**

  Complex **problem solving** often require complex thinking to get to simple, effective, easy to implement solutions. When a team is very homogenous, they tend to think very rigidly and one-dimensionally.

  Consider a football team. Coaches understand the need for a well-balanced set of skills. A team needs big guys for the offensive line. It needs a quick thinker who can throw well for its quarterback. It needs strong players for running backs and linebackers, and fast players as receivers. With only big guys, or just fast guys, a team would fail.

  Learn More About This Term...

- **Cross-training**

  Cross-training employees is exactly what it sounds like—multiple people**trained** on each job, and each person trained on multiple jobs.

  Cross-training employees provides **flexibility**. It allows **leaders** to shift people around to cover for breaks, vacations, and illnesses. It also allows leaders to adjust staffing when there are shifts in **demand**.

  Learn More About This Term...

- **Culture, Continuous Improvement**

  See also Continuous Improvement Culture.

  Learn More About This Term...

- **Curiosity**

  Curiosity is the desire to learn more, or the state of dissatisfaction with a lack of knowledge. It is also a fundamental part of any **problem solving** mentality.

  Curiosity provides the drive to follow up on an issue once it is identified. It gives the spark that makes people continue to question what is going on even after the surface answer has been found. It also prevents accepting a "brush-off" answer to a question.

  Learn More About This Term...

- **Current State Map**

  A current state map is a snapshot of how a **process** is currently done. It may be a current state process **flowchart**, or a current state **value stream map** (VSM), but the principle is the same. It shows the current methodology of how you produce products or perform services for your customers.

  Learn More About This Term...

- **Current State Value Stream Map**

  The current state value stream map provides a 30,000 foot snapshot of how an organization operates. One of the unique aspects of this tool compared to others is that it shows the flow of both materials and information.

  This tool is extremely useful for a few reasons:

  - It provides eye-opening insight into the level of waste in an organization.
  - It provides a foundation upon which to build a plan to improve.
  - It acts as a communication tool to make sure that everyone in the organization is on the same sheet of music.

  Learn More About This Term...

- **Customer Behavior**

  Customer behavior is the way the average customer, in a specific target group, will act in a given situation.

  Customer behavior depends on a host of factors—economic class, psychology, region, culture. Like-minded customers tend to behave in similar ways. That is why ads are targeted to specific groups.

  Learn More About This Term...

- **Customers**

  Who is a customer in the modern world? He is demanding. He wants his product immediately. He wants value, but that doesn't mean cheap. It just means that he wants to feel like he gets a little more for his money. And he wants products that work, and services that deliver on their promises.

  These demanding customers are the reason **Lean** exists at all. The demands they place on companies, and their willingness to vote with their wallets and feet makes **continuous improvement** a business imperative. If your company does not do it, your customers will quickly find one that does.

  Learn More About This Term...

- **Cycle**

  A cycle is the time from the start of a process until the operator (or machine) is *ready to start* the next time through the **process**.

  An alternative definition of cycle says it is the time from the start of one part until the start of the next part.

  Learn More About This Term...

- **Cycle Time (+ 9-Page Lean PDF +Videos +MP3 +Form)**

  Understanding how long work takes is a critical aspect to making improvements. Cycle time play a big role in staffing decisions as well.. Visit this Lean term page to learn more and download a FREE 9-Page Cycle Time PDF.

  Learn More About This Term...

- **Cycle Time Reduction**

  Cycle time reduction is the strategy of lowering the time it takes to perform a **process** in order to improve **productivity**.

  In addition, cycle time reduction often improves quality. When a cycle time is too close to the *takt* time, there is little margin for error. If a process is dialed in with very little variation, this is seldom a problem. But most processes have some inconsistency in them, resulting in people falling behind the normal pace on occasion. This leads to them rushing, which, in turn can lead to mistakes. Reducing cycle time is a low cost way to add a bit of a buffer to avoid those sorts of defects.

  [Learn More About This Term...](#)

"D" TERMS

- ## Daily Improvement

  Daily improvement is the strategy of making constant, incremental improvements each and every day in order see impressive long term gains.

  While many people see *kaizen* as just a week-long event, it is much more powerful when an entire workforce engages in daily improvement efforts.

  Daily improvement does not have to be extreme. Moving a garbage can closer to where it is needed, or labeling a location for a stapler near a copier are both examples of small daily improvements that add up over time.

  Learn More About This Term...

- ## Daily Management (+13-Page PDF, +Video, +Form)

  Daily management is an ongoing PDCA cycle used to review an operation's performance against expectations. More importantly, it is intended to drive process improvements when there is a mismatch. Watch a short video, and download a FREE 13-Page PDF on Daily Management.

  Learn More About This Term...

- ## Daily Management Worksheet

  The Daily Management Worksheet is a tool to help you quickly plan your day and update your production board.

  Format: XLSX   **Regular Price:** Free for Registered Users

  Learn More About This Term...

- **Dashboard**

  Businesses have an incredible amount of **information** flowing into them. It is often impractical for people to process the **data** and make quick assessments and corrections to the business without some sort of **simplification** tool. One such tool is the dashboard. It is simple view of the key **metrics** of a business. One can take a quick look at it and see the state of the company—much like one can glance down at the dashboard on a car and see what is happening.

  On a dashboard, some metrics are can be combinations of multiple other metrics. A weighting system is used to aggregate similar metrics.

  Learn More About This Term...

- **Data**

  Data (the plural form of datum) is essentially information that is not yet in context, or without any applied meaning. For example, if you were told that a particular elephant in a zoo weighed 5,800 pounds, you could comprehend how heavy that is, but it would be hard to act on it. You might not know the gender of the animal, and may not know the average weight of the species, so you could not categorize the animal as large or small, and could not, for example, take actions to improve its health.

  For that reason, the data must be applied to a situation to be useful. When data has meaning attached to it, it turns into information.

  Learn More About This Term...

- **Data Collection (+ 9-Page Lean PDF, + Video)**

  Data collection is a core skill for continuous improvement. Decisions must be based in fact to be effective. Review this term online, or download a FREE 9-Page PDF on Data Collection.

  Learn More About This Term...

- **Days Sales of Inventory (DSI)**

Days sales of inventory (DSI) is an accounting measure that gives an idea of how much **inventory** is on hand in a company. A large number means the company is generally **inefficient** at turning raw materials into **profit**. The formula for DSI is:

$$Days\ Sales\ of\ Inventory = \left(\frac{Average\ Inventory}{Cost\ of\ Goods\ Sold}\right) * 365$$

The average inventory is calculated as follows:

$$Average\ Iventory = \frac{Starting\ Inventory + Ending\ Inventory}{2}$$

Learn More About This Term...

- **Days Sales Outstanding (DSO)**

Days sales outstanding is a measure of how **effective** an organization is at getting paid. DSO indicates how many days of sales are still left uncollected.

Obviously, an excessively high number means a lot of cash is tied up in the cost of producing and shipping products. On the surface, it might seem that the lower this number is, the better. It is true to a degree, but at some point, overly restrictive credit policies and aggressive collections will alienate **customers** and cost sales.

The basic formula for DSO is:

$$Days\ Sales\ Outstanding = \frac{Account\ Receivables}{\left(\frac{Credit\ Sales}{Number\ of\ Days}\right)}$$

Learn More About This Term...

- **Deadlines**

  Deadlines are, simply put, the date something is due.

  Deadlines may be externally dictated, such as the Internal Revenue Service's April 15th deadline. They may also be internally set. You may establish March 15th as the date you want all of your tax records gathered. External deadlines tend to carry far more weight than self-imposed due dates because there are often sanctions associated with missing other people's requirements.

  [Learn More About This Term...](#)

- **Decision (+Video)**

  A decision is a choice between two competing or alternative options. We make countless decisions each and every day—what to wear, what to eat, the route to take to work.

  Some decisions are made so rapidly that they are virtually automatic. You make a decision every time you adjust the steering wheel on the car, surf the internet, and carry on a conversation.

  [Learn More About This Term...](#)

- **Decision Matrix Template (+Video +Tool)**
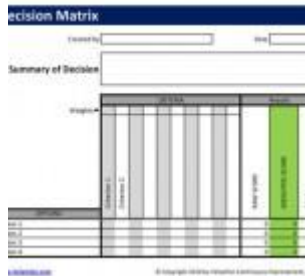
  The Decision Matrix Template is a tool designed to simplify your decision-making process and take the guesswork and emotion out of selecting a course of action.

  Format: XLSX   **Regular Price:** Free for Registered Users

  [Learn More About This Term...](#)

- **Decision Point**

  There are two basic definitions for decision point.

  The first is on a macro level. It is the latest point in time when a decision must be made within a plan. In many cases, it is advantageous to delay making a final choice until the last possible moment—it keeps options open. But at some point, it becomes too late for the decision to matter.

  Learn More About This Term...

- **Decision Trees**

  A decision tree is a tool that helps calculate the expected values of the choices that are available to you.

  It uses probabilities of events happening and estimates of each possible outcome to help you make a decision. For example, if you called in to a radio contest where you got a chance to choose between a 1 in 10 chance of winning fifty dollars, and a 1 in 100 chance of winning a thousand dollars, which would you pick?

  The expected value of the first option is 10% x $50, or $5. The second option is 1% x $1,000 or $10. The second option has a better payout.

  Learn More About This Term...

- **Decision-Making**

  Decision-making is the process for selecting from two or more competing options. You make decisions on who you will marry (one open spot, multiple candidates), where to go on vacation (vacation locales competing for your time and money), and how you want to invest the ten grand you got from your Aunt Elizabeth.

  You also make decisions in business every day. You have to decide on a configuration for the call center. You have to decide on where to build the next plant. You have to decide which customer to call next, of if you believe the story about the MP3 player being smashed when the customer got it.

  Learn More About This Term...

- **Dedicated Equipment**

  Dedicated pieces of equipment are machines and tools that are specified for specific tasks or **workstations**. The primary purpose of dedicating equipment to a specific process step is to accommodate flow. If a machine is shared, it may not be available when needed, causing items to wait in a queue.

  Learn More About This Term...

- **Defects**

  Defects are the undesirable results of an error in a process. In most cases, this shows up as a product or service not conforming to a specification.

  Defects are often expressed as either yield of good parts, such as a 95% yield (meaning a 5% defect rate), or as Defects per Million Opportunities (DPMO).

  Learn More About This Term...

- **Define (DMAIC Step)**

  The define step of DMAIC is where the problem statement is created, the project is scoped, and the team is created. The define step lays the foundation for the success of the project.

  A central part of the define step is to build a business case. That simply means gaining a clear understanding of why the project is important and what it will mean to the business when it is completed.

  Learn More About This Term...

- **Delegation**

  Delegation is the act of appointing another person or group, usually a subordinate, to perform a specific task or role.

  For delegation to be successful, it should include the transfer of power along with the assignment—the **authority** of the subordinate to act on the boss's behalf.

  Learn More About This Term...

- **Delivery**

  Delivery is one of the legs of the **QDC (quality, cost, delivery)** acronym. It is a very simple concept—to get paid, you have to get your product to your**customer**.

  Learn More About This Term...

- **Delphi Method**

  The Delphi method of predicting outcomes has been around for a long while, but is not widely used in continuous improvement. It is the process of anonymously posing similar questions to many experts and using their results to further a discussion to predict a future outcome.

  Learn More About This Term...

- **Demand Windows**

  Demand windows are periods of time when **customer demand** is relatively stable. For slow **growth** or mature products, the window can be extremely long.

  For other products, demand windows can change **seasonally** (think water skis), hour-by-hour (think fast food), or can trend steeply up or down.

  Learn More About This Term...

- **Demand, Customer**

  Customer demand is the '**pull**' from a customer. While the demand can be for a free product (such as **The Continuous Improvement Companion**), the great majority of time, customer demand is what customers actually want to purchase.

  Don't confuse customers saying they want to purchase something with actually buying something. There is a considerable fall-off between a customer admiring a product or service, and then actually opening up her wallet.

  Knowing your customer demand is critical to Lean operations. Customer demand plays a role in determining *takt* **time**, and in developing *kanban*quantities—both fundamentals of Lean.

  Learn More About This Term...

- **Deming Cycle**

  The Deming Cycle, also known as the **Plan-Do-Check-Act** (PDCA) cycle is a**standardized** system for…

  - making gains in **quality**
  - conducting **continuous improvement**

  Learn More About This Term…

- **Design for Manufacturing (+ 8-Page Lean PDF)**

  Lean operations can only compensate so much for a poor design. Planning ahead during the design process, though, can maximize the potential impact Lean can have on an operation. Visit this Lean term page to download a FREE 8-Page PDF about Design for Manufacturing.

  Learn More About This Term…

- **Design of Experiments**

  A 'Design of Experiment' (DOE) is the process of determine the interaction of KPIVs (Key Process Input Variables) on the output of a process. It attempts to quantify the relationship of the variables in order to optimize the settings for that **process**. A key point of the design of experiment process is that it changes several variables at once. That allows the statistics behind the process to identify interactions between the KPIVs. The design of experiments methodology is closely associated with **Six Sigma**.

  Learn More About This Term…

- **Diminishing Returns**

  Diminishing returns happen when resource (time, effort, money, space) yields less output than it did at an earlier time.

  In math jargon, diminishing returns happen when the **productivity** curve starts to flatten out.

  Learn More About This Term…

- **Dirty, Dumb, or Dangerous (+ 5-Page Lean PDF +MP3)**

Dirty, dumb, or dangerous jobs make work far harder than it has to be and erodes job satisfaction. It follows that eliminating those problems will have a big impact on engaging employees. Visit this Lean term page to learn more and download a FREE 5-Page PDF about dirty, dumb, or dangerous jobs.

Learn More About This Term...

- **Discipline**

Discipline is the process of changing a behavior to make it conform to a rule or standard. For many people, discipline has a negative connotation to it, especially when it is their behavior that is being adjusted.

In truth, though, discipline is more than repeating the standard and doling out punishment.

Learn More About This Term...

- **Disputes**

Disputes are about **processes** are disagreements or differences of opinion about the way that something should be done. Disputes are nothing new at work.

In **Lean** companies, the challenge is that processes are always changing. This provides multiple opportunities for disputes to arise.

Learn More About This Term...

- ## DMAIC Cycle

  The DMAIC cycle takes the **DMAIC** process one step further. It links the end of one project, the **'Control' step**, to the beginning of the next one (the **'Define' step**).

  The rationale behind linking DMAIC cycles together makes a lot of sense. When controls are applied to **processes**, deviations become more apparent—after all, much of establishing controls involves measuring processes. **Data** starts to fill knowledge voids, providing new opportunities to continue the DMAIC cycle when previously unidentified problems become apparent.

  Learn More About This Term...

- ## DMAIC-Lean Six Sigma Problem Solving

  Lean makes extensive use of the term **flow**. As a result, one of the most common teaching analogies Lean practitioners use is that of a meandering river being slowly but surely turned into a deep, straight, fast moving channel.

  That flow starts at the supplier, and finishes at the customer. As a result, 'downstream' refers to any movement in the direction of the customer.

  Learn More About This Term...

- ## Documentation

  DMAIC is an acronym for **problem solving** in the **Six Sigma** process. It stands for Define-Measure-Analyze-Improve-Control. The pronunciation is Duh-May-Ick.

  While Six Sigma = DMAIC for many people, there is another improvement method that also uses DMAIC: **Lean**. If you look at the *kaizen* process, you will notice that it follows nearly the same steps as the DMAIC methodology. Other problem solving methods have similar approaches as well. For example, the **8D** process very closely parallels the DMAIC methodology.

  Learn More About This Term...

- **Downstream**

  Lean makes extensive use of the term **flow**. As a result, one of the most common teaching analogies Lean practitioners use is that of a meandering river being slowly but surely turned into a deep, straight, fast moving channel.

  That flow starts at the supplier, and finishes at the customer. As a result, 'downstream' refers to any movement in the direction of the customer.

  Learn More About This Term...

- **Drawers**

  When using drawers to store equipment, one expression stands out: Out of sight, out of mind. Things in a drawer tend to get piled up, misplaced, and forgotten about. Drawers take time to open and close, and slow down**processes**. They hide things.

  Bottom line: Drawers are fine for storage, but they hinder **5S** and **flow** in a production environment.

  Learn More About This Term...

- **Drift (Process)**

  Most **processes** change over time. A car will age, and as it undergoes normal wear and tear, gas mileage will worsen. It won't be an overnight change, but it will trend downward. This is drift. Processes, with no visible changes, often slowly perform differently. A **fixture** may loosen up over time, making it take longer to fasten the product in place. A measuring device may be subjected to a series of small bumps over time the slowly changes its readings, making subsequent tasks take longer.

  Learn More About This Term...

"E" TERMS

- ## Economy of Scale

  Economy of scale means that an organization is structured in such a way that as production volumes rise, per unit **costs** fall. In effect, this is a fancy of way to say 'bigger is better'.

  It is based on the idea that a product has two basic components to its cost, fixed and variable. Fixed costs stay constant as production fluctuates, and variable costs shift as production changes. The cost of a building, for example, stays constant regardless of whether zero units or a million units are produced inside of it. The spending on widgets that go into the Widgetron 2000, conversely, goes up and down with the ebb and flow of production.

  Learn More About This Term...

- ## Effectiveness

  Effectiveness is like the transmission of a car. It turns potential into results.

  Of course, there are two implications here. The first is that an individual has skills or characteristics that *can* lead to the desired outcome, or that a machine or process has the right capability and enough capacity.

  Just having the skills is not enough, though. A college degree doesn't make a person effective at a job. It just tends to raise the potential of high performance. A fast machine doesn't guarantee that the machine will be effective in a value stream. It just means that the manufacturing math *can* work out.

  Learn More About This Term...

- ## Efficiency

  Efficiency, in the strictest sense of the definition is being able to produce something with the minimum amount of time and resources. Efficiency in Lean comes with a few cautions.

  The first warning regarding efficiency in Lean is to make sure you are using the term the same way that the people around you are. The definitions of efficiency, productivity, and utilization are all used in different ways by different people.

  Learn More About This Term...

- **Emotions**

  Job emotions are rarely talked about. But let's begin with emotion in general. Emotion is something that we are all familiar with. It is the internal reaction we have to things- the shriek when if you win the lottery, the gasp at the bad news, and the anger when someone tells us we are going to have to change our process.

  Job emotions, though, tend not to be outwardly expressed. People might burst into song with their kids at home. It seldom happens at a successful business meeting. Anger is expressed more vocally to friends on the basketball court than to bosses on the shop floor. Fear is addressed with spouse more than with coworkers.

  Learn More About This Term...

- **Employee Engagement**

  Employee engagement describes a state of workers' full commitment to the success of the company.

  Employee engagement is characterized by the worker making the extra effort and linking her personal success to corporate success.

  Employee engagement relies on two factors:

  - **job satisfaction**
  - The ability to contribute in his role

  Learn More About This Term...

- **Enforcement**

  Enforcement is the act of compelling someone to follow a **standard**. Think of enforcement as the strong arm of **discipline**.

  With good discipline, people are inspired to follow rules and meet standards. But, as in all things, there are long tails on the discipline bell curve—some people naturally do the right things (especially **engaged employees**). Others need a push in that direction now and again. That's where enforcement comes in.

  Learn More About This Term...

- **Engineers**

  Engineers, not surprisingly, are people who are specially training in an engineering field. In a nutshell, they design solutions to a **problem**.

  Types of Engineers:

  - **Design engineers** solve problems by creating a product.
  - **Software engineers** solve problems with code.
  - **Manufacturing engineers** create processes to solve problems.

  Learn More About This Term...

- **Ergonomics**

  Ergonomics is the broad study of how people interact with their environment. It covers a wide range of these interactions—from how people fit into their cars, to the way tools feel in people's hands, to motion in the workplace. As with your car, a proper 'fit' in the workplace makes a job much easier to perform. More importantly, it also can help to reduce injury.

  There is a strong relationship between ergonomics and repetitive stress injuries. Lifting heavy objects at uncomfortable angles is also known to cause injury.
  Finally, **fatigue** occurs in poorly designed work areas. This can contribute to a higher injury rate because tired people tend to make more mistakes than rested ones.

  Learn More About This Term...

- **Errors**

  Preventing errors is one of the ways Lean helps reduce waste.

  Before we talk about preventing errors, let's first talk about what errors are. They are the gap between what happened and what should have happened. Simply put they are mistakes.

  Errors link to defects. Every defect that is identified can be tied to some error in an upstream process. It might be a supplier error, but it is still an error. Obviously, preventing errors in the first place prevents defects that can slip through to customers. Preventing errors reduces **waste**-an important foundation of Lean.

  Learn More About This Term...

- **Evidence**

  Evidence is the **data** that supports a theory. It is what separates opinion from fact.

  Lean relies heavily on **problem solving** to make improvements. In order to get to the **root cause** of a problem, people in Lean companies must act like detectives, uncovering evidence to understand **processes** better.

  Learn More About This Term...

- **Executives**

  Executives are the senior leaders in an organization. They make the sweeping decisions that affect a large cross-section of the company at the same time. These senior leaders are usually the ones responsible for bringing **Lean** into an organization and setting the course that it will follow.

  Learn More About This Term...

- **Expectations**

  Setting expectations is part of the relationship building process–whether between a boss and a subordinate, or a Lean advocate and the rest of the company.

  One of the things that sets the human mind apart from that of animals is our ability to look into the future. That is generally a good thing, but there is one challenge that can come from this. When people look forward, they set expectations in their mind. When reality does not match up with this premonition of the future, anxiety, anger, or a host of other negative **emotions**can set in.

  Learn More About This Term...

- **Experience**

  Does experience matter anymore? Despite the fact that people talk about experience with a degree of reverence, it has a changing role in continuous improvement.

  Experience is defined as having knowledge or practical wisdom from having done something. The more it was done, the more experience a person gained.

  Learn More About This Term...

"F" TERMS

- ## Fabrication

  Fabrication is the act of taking stock material and turning it into a part for use in an assembly process. There are many different types of fabrication processes. The most common are

  0. *Cutting.* There are many ways to cut nowadays. The old standby is the saw. Others now include plasma torches, water jets, and lasers. There is a wide range of complexity and cost, with some machines costing in the millions.
  1. *Folding.* Some parts need to be bent. The most common method is a press brake (or brake press). It has a set of dies that pinches the metal to form a crease. This operation can only be performed in very specific cases due to the movement of the part and the possible shape of the dies. Designing for Lean manufacturing, though, can help prevent complex shapes that slow down production. Sometimes using two different types of fabrication processes or two different pieces fastened together work better than one complicated piece.

  Learn More About This Term...

- ## Facilitation

  The dictionary definition of facilitation is to make something easier. In this broad definition, facilitation covers a lot of ground. But in the continuous improvement definition, facilitation has a few common characteristics.

  0. Facilitation is generally done for groups, not for individuals.
  1. Facilitation is most common for discrete projects. You might see a facilitator for a *kaizen* event, but probably not just to help with day-to-day operations.
  2. Facilitation should focus on tools, not processes. A facilitator should walk teams through a decision making process, not make the decision for them.
  3. Facilitation should focus on getting good results, not on implementing a particular method.

  Learn More About This Term...

- **Factory**

  A factory is a discrete building or group of buildings that produces a product or product line.

  The first image that comes to mind with the term *factory* is often a car manufacturing facility, like those run by **Toyota** (a company well-known for its **Lean manufacturing**).

  Learn More About This Term...

- **Facts and Data**

  Facts and data are the supporting **evidence** for **making decisions**. Gathering facts and data is a key part of any **problem solving process**, but it becomes particularly important in **Lean**.

  Learn More About This Term...

- **Fatigue – Employee**

  Fatigue is the state of physical and mental state of tiredness that results in diminished **capacity** to perform a task or function. Because it increases the likelihood of **errors**, **quality** problems and **rework**, employee fatigue is an often unrecognized form of **waste** that can impact the **safety** of the workplace.

  Learn More About This Term...

- **Feeder Lines**

  Feeder lines are a very specialized branch of a main **assembly line**. Generally, they are used when there is a different amount of work required for an option or for the most time intensive product on a mixed-model assembly line.

  Feeder lines will run on their own *takt* **time**. The **demand** on the feeder line is determined by the station that it supplies parts to. It will run at a different pace than the main assembly line.

  Learn More About This Term...

- **FIFO (First In First Out)**

  FIFO (First In, First Out) is most commonly known as an accounting term. It simply means that the first inventory into the accounting system is the first that is recorded as used. The opposite, LIFO, or "Last In, First Out" means that the most recently purchased materials are the first ones recorded as consumed.

  FIFO and LIFO accounting each has its own advantages and disadvantages, primarily attributed to inflation. For example, when prices rise, LIFO more accurately captures true cost of the goods, while leaving older, less expensive material on the books.

  [Learn More About This Term...](#)

- **FIFO Lane**

  A FIFO lane (First In, First Out) helps manage **flow** in a **process**. It is exactly what it sounds like. The first item coming into a process is the first one worked on.

  FIFO lanes provide **consistency** and predictability. They create a link between a process and its **upstream** supplier.

  [Learn More About This Term...](#)

- **First In First Out (FIFO)**

  See FIFO.

  [Learn More About This Term...](#)

- **First Pass Yield**

  First pass yield (FPY) is a metric that indicates the percentage of items moving through a series of **processes** without any problems.

  The basic equation for first pass yield is:

  *First Pass Yield = Process 1 Yield * Process 2 Yield *…*Process 'n' Yield*

  [Learn More About This Term...](#)

- **FISH / First In, Still Here**

  FISH, or "First In, Still Here" is a tongue-in-cheek term for **excessive inventory**. It is a play on the terms **FIFO (first in, first out)** and LIFO (last in, first out).

  Learn More About This Term...

- **Fishbone Diagram**

  The fishbone diagram (a.k.a. cause and effect diagram, a.k.a. Ishikawa Diagram) is a way of linking the causes of a problem to the observed effect.

  The diagram groups the causes in categories along the spine. The distinctive shape of the tool gives the fishbone diagram its name.

  Learn More About This Term...

- **Five "Whys"**

  See 5 Whys.

  Learn More About This Term...

- **Fixtures**

  A manufacturing fixture holds parts during the manufacturing process. Fixtures come in a wide range of types.

  In their simplest form, they may be a series of pins sticking up from a flat surface to keep a part from sliding. They can also be much more complicated, with a series of mechanical or hydraulic clamps to lock a part down into an automated rotating frame.

  Learn More About This Term...

- **Flat Surfaces**

  Flat surfaces are bad for work areas.

  0. They collect dirt, dust, debris, etc.
  1. They don't support **processes**.
  2. People use them for storage.

  Learn More About This Term...

- **Flexibility**

   Process flexibility applies both to the ability to rapidly change model mix as well as to change layouts of your facility. As continuous improvement speeds up its pace, you will find that your production areas enter a state of constant flux.

   Build process flexibility into your workstations. Suspend power and air lines from the ceiling, and attach them to the top of your workstations with quick disconnects. Put your stations on wheels. Make them small enough to get through door openings, or make your doors wider. Break big workbenches into multiple small ones to add more flexibility to process improvement.

   Learn More About This Term...

- **Flow**

   Making operations flow is the ultimate goal of Lean. When all the **waste** is reduced, every **process** is improved, and the excess inventory is eliminated, you are left with work that effortlessly glides through operations.

   Flow is often talked about reverently. The *senseis* I worked with from a premiere Japanese consulting group frequently talked about flow. Next to "waste", flow was one of the few words they would speak in English-to stress its importance.

   Learn More About This Term...

- **Flow Chart (+ 11-Page Term on PDF)**

   Flow charts are an instrumental tool for continuous improvement and problem solving. Their visual nature make waste and complexity jump out, highlighting improvement opportunities. Review this term online, watch a short video, or download a FREE 11-Page PDF on Flow Charts.

   Learn More About This Term...

- **Flow Production**

    Flow production is one of many names used to describe a system of production that predominantly follows Lean principles.

    It is typified by single units of work moving directly from one process to the next without stopping in queues. That state of streamlined motion is known as **flow**, and is the holy grail of **Lean** production.

    Learn More About This Term...

- **FMEA Worksheet / Failure Mode and Effects Analysis Sheet (+Form)**

    The FMEA Worksheet provides a means of assessing and managing risk associated with a new product release or a new Lean process.

    Format: XLSX

    Regular Price: Free for Registered Users

    Learn More About This Term...

- **Follow-Up**

    Follow-up is the act of making sure that

    - something was supposed to be done was, in fact, done, or
    - that something that was done is working as planned

    Learn More About This Term...

- **Form, Fit, and Function**

  "Form, fit, and function" are most commonly discussed in relation to the design of an object, or when considering if a process is value added or not.

  - **Form:** Form is the physical characteristics of the product. It includes things like shape, weight, color, material, etc.
  - **Fit:** Fit is short for 'fits intended application'. Alternatively, it may also reference whether the physical dimensions of a part fit into the product it was designed to go into.
  - **Function:** Function is what the product actually does.

  Learn More About This Term...

- **FPY (First Pass Yield)**

  See First Pass Yield.

  Learn More About This Term...

- **Frontline Employees**

  Frontline employees are the people who do the ongoing production work in an organization. While the range and skills of frontline employees vary widely, most of the entry-level jobs within the company fall into this category. That is not to say all jobs are entry-level. There are many senior production workers, especially among skilled fabricators and machine operators.

  Learn More About This Term...

- **Frontline of Change**

  The people actually doing a **process** a new way are at the frontline of change. They are the ones who must enforce new processed with internal customers, manage changes with suppliers, or work with customers to educate them about the new and improved methods.

  Working at the frontline of change can be physically challenging, as it often demands long hours during the adjustment period, but it can also be emotionally draining.

  Learn More About This Term...

- **Frustration**

  Frustration is the feeling of anxiety or dissatisfaction that results from the gap between expectations and reality. Frustration happens when **problems** are unsolved and when things don't go according to plan.

  Lean depends heavily on **employee engagement** and **job satisfaction** to work at its best. Frustration reduces job satisfaction, thereby lowering the **effectiveness** of Lean efforts.

  Learn More About This Term...

- **FTE**

  FTE, or 'full-time equivalent', is a way to normalize staffing decisions. In the modern workforce, particularly in **administrative** environments, employees perform multiple functions, or work unusual schedules.

  Using FTE to determine the size of the workforce makes accurate **productivity** and **cost** measures possible. A full-time equivalent 'person' is simply 40 hours of working time. This could be a single person working in one role, or four people each working 10 hours on a particular job.

  Learn More About This Term...

- **Full-Time Equivalent**

  See also FTE.

  Learn More About This Term...

- **Functional Layout**

  A functional layout is a workplace organization in which **processes** are organized by the type of work (function) rather than by **value stream** or in a **cellular** configuration where sequential process steps are located in close proximity. In a functional layout, for example, the cutting machines would be in one location, the press brakes would be in one group, the welders would all be together, and so on.

  The same is true in office environments. Each functional group sits together in a work area, and supports multiple product teams.

  Learn More About This Term...

- **Future State Value Stream Map (VSM)**

  A future state **value stream map** (VSM) is simply a projection of how a **value stream** should look in the future, generally 6 to 12 months.

  When a current state value stream map is created, problem areas become apparent. The **bottlenecks** where **inventory** piles up, **processes** with poor**quality**, and operations requiring excessive coordination should all be marked with *kaizen* bursts, which indicate areas of focus for the future state value stream map. Operations where work is pushed **downstream** should also be highlighted.

  Learn More About This Term...

"G" TERMS

- **Gap Analysis**

  Gap analysis is the art of identifying where performance or capability falls short of needs, and of coming up with an effective way of addressing that gap, also occasionally referred to as the 'delta'.

  That delta comes in one of two forms. The first is that there is a gap in capability. For example, you want to be able to paint your products, but have no paint shop in your organization.

  Learn More About This Term...

- **Gauge**

  A gauge is a measuring device. A gauge can be as simple as a piece of string cut to a specific dimension or a cutout of an animated character with an outstretched arm with the caption, "You must be this tall to ride this attraction."

  On the other end of the spectrum, a gauge can be a calibrated pressure sensing device or a laser measuring device.

  Learn More About This Term...

- **Gauge R&R**

  Gauge Repeatability & Reproducibility (Gauge R&R) uses a statistical method (ANOVA) to analyze the **variation** in a measurement system. It determines if a measurement process is repeatable, meaning if you measured the same thing several times the results would be **consistent**. It also determines if a measurement process is reproducible, meaning that someone else can step in and do the measurement with the same results. Gage R&R assesses the whole system, not just the measuring device. Individual instrumentation is not checked, but rather the use of the instruments in a specific application.

  Learn More About This Term...

- **Gemba (+4-Min MP3, +6-Page PDF)**

 You can't really understand a process until you see it at *gemba*-the real place where the work is done. Learn about this term, answer a poll question, listen to a short audio program, and download a FREE 6-Page PDF on *gemba*.

[Learn More About This Term...](#)

- **Gemba Walk**

A *gemba* walk is a leadership process in which a manager walks through his or her areas of responsibility in order to gain a better understanding of how the operation is running. The **term "*gemba*" means "the real place" in Japanese**. The level of structure of a *gemba* walk varies by the individual. They range from a simple walkthrough on up to a formal **checklist** containing specific things to look for.

Gemba walks should be a regular, recurring part of a leader's personal standard work.

[Learn More About This Term...](#)

- **Gembutsu**

Gembutsu is a Japanese word meaning 'real thing'. It is one of the components of the '**Three Reals**' meaning go to the real place (*gemba*) to see the real thing (*gembutsu*) and collect the real facts (*genjitsu*).

This term simply means that there is no substitute for seeing something with one's own eyes. Far too often, people hear about a process or problem, and take what they hear as fact. Watching an actual item being made or form being processed gives an increased level of insight that helps with problem solving as well as making improvements.

[Learn More About This Term...](#)

- **Genchi Genbutsu**

  Genchi Genbutsu is a Japanese term that loosely translates to "go and see". Essentially, it means to go to the actual spot where actual work is happening on the actual product to confirm your conclusions.

  Learn More About This Term...

- **Go / No-Go Gauge**

  Many parts and instruments have specifications that call for a tolerance. That just means that there is a given range within which the part has acceptable**quality**.

  One way to determine if the part is good is to measure and compare the results to the **specification**. This, however, is a slow process.

  Learn More About This Term...

- **Go to Gemba**

  The refrain 'Go to *Gemba'* simply means to go to the place where the work is being done for answers to process questions.

  Far too often, *kaizen* teams will discuss a process while sitting in a conference room. Instead, they should 'go to *gemba'* and be where the action is. Actually being close to the sights, sounds, and smells of a shop floor makes the nuances of a process leap out at you.

  Learn More About This Term...

- **Goal Setting**

  A simple goal setting definition is that it is just the act of declaring something that you want to achieve, and putting some specific parameters around the end result-the who, what, when, where, why.

  This goal setting definition, though, is overly simplistic. Goal setting has a large component of an art form to it. It requires knowing yourself and your team, and having a realistic understanding of everyone's capabilities.

  Learn More About This Term...

- **Green Belt**

  A "Green Belt" is a certification that indicates a person is qualified to lead a Six Sigma project or, less frequently, a *kaizen* team in Lean.

  Learn More About This Term...

- **Groupthink**

  Groupthink is the condition in which individuals set aside their beliefs and concerns to conform to group opinion. This is most commonly done because people value the cohesion of the group more than the risk of a poor outcome.

  While the term was first coined by William H. Whyte in *Fortune* magazine in 1952, a Yale psychologist, Irving Janis, did much of the early work on the theory.

  Learn More About This Term...

- **Growth**

  Growth is the driver of stock appreciation. The basic way investors determine what to pay for a stock is to look at the value of its assets, minus its liabilities, and then factor in expected future earnings.

  With growth, those expected earnings get bigger, and the company's stock prices go up. The reverse is also true.

  Learn More About This Term...

- **Guidance**

  Guidance is the way that a **leader** or **mentor** provides assistance to another person to help her reach her goals.

  Guidance is more general in nature than specific directions. The goal is to help a person **make a good decision** on her own, not to tell her what to do.

  Learn More About This Term...

- **Guidelines**

  Guidelines are general instructions on how to **make decisions**. Unlike specific policies and **processes**, guidelines are not rigid. Guidelines are loose blueprints for success, such as 'Don't swim for 30 minutes after eating.'

  Contrasting with policies and rules, there are generally no sanctions for disregarding guidelines.

  Learn More About This Term...

"H" TERMS

- **Hammers**

  Enter a heavy manufacturing facility, and you will likely hear the 'clank, clank, clank' of metal hammers, or the dull thud of a dead blo w hammer. Hammers are used to compensate for a **quality** problem elsewhere. In most cases, they are used to 'adjust' a component, or install something that was designed with too little tolerance to be easily assembled.

  Learn More About This Term...

- **Handoffs**

  Handoffs are the times work is passed from one person to another person. In most cases, a handoff entails reorienting the work and getting it ready to add value to it.

  Handoffs in manufacturing act a little like a speed bump. It creates a hiccup in the **flow** of work. When the handoff is disjointed, the effect is bigger. Think of putting parts into a cart that sits in queue, and then has to be wheeled over to the next step in the process. The poor handoff creates waste.

  Learn More About This Term...

- **Hanedashi**

A *hanedashi* device is an automatic part ejector. It reduces waste when an operator approaches a machine to load the next part. In a machine without a *hanedashi* device, the operator would have to set down the new part that he would be carrying to the machine, pull out the completed part and set it down, pick up the new part, load it, and then pick up the completed part again.
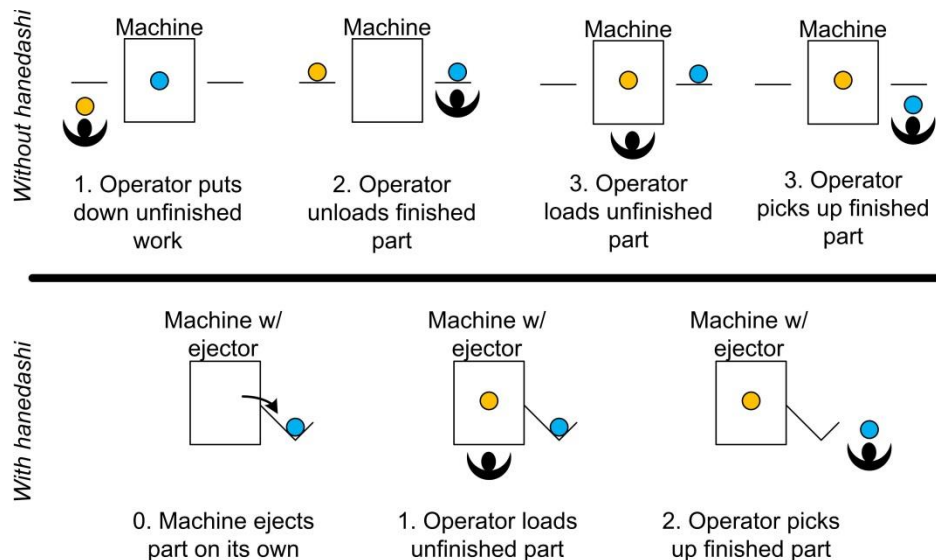
Learn More About This Term...

- **Hansei**

Hansei is a Japanese term that loosely translates to self-reflection. In practice, though, it is much more than that. *Hansei* requires several things.

0. A person must recognize that there is a **problem** in personal performance. *Hansei* is not a run-of-the-mill assessment tool. It looks at personal failings rather than system or **process** problems.
1. The person must take responsibility for the shortcoming. Being called on the carpet is not the same as *hansei*. Owning the mistake is a critical part of this form of reflection…

Learn More About This Term...

- **Hard Savings**

  Hard savings are those that are directly attributed to an actual expense. There should be no confusion about how much was actually saved, as there is an invoice, payroll stub, bill, receipt, or the like associated with the expense.

  [Learn More About This Term...](#)

- **Hawthorne Effect**

  The Hawthorne Effect originated from experiments at the Hawthorne Works, owned by Western Electric, in Cicero, Illinois in the first half of the 1900's. While there were a variety of experiments, the most commonly referenced study was about illumination.

  Researchers conducted a series of experiments to identify the optimal lighting levels in the workplace. Initial findings showed that increasing lighting levels resulted in **productivity** increases. The effects, however, were short-lived. Continued experiments showed that *whenever* lighting changed, either brighter or dimmer, there was an increase in productivity. This led to a series of further experiments over an extended period that looked at other factors affecting worker performance.

  [Learn More About This Term...](#)

- **Heijunka**

  The common *heijunka* definition, production leveling, means transforming the typical peaks and valleys of **customer demand** into something flatter. That flatness, in turn, makes **standardizing** production **processes** easier.

  [Learn More About This Term...](#)

- **Henry Ford**

  Henry Ford (July 30, 1863 – April 7, 1947) is the man most widely known as the founder of Ford, and as the man who invented the moving **assembly line**. While the first is true, the second common belief is a bit inaccurate. Ford actually popularized the moving assembly line; he didn't invent it. There were numerous other examples of moving assembly lines prior to Henry Ford's 1908 line producing the Model T.

  In fact, Henry Ford was not even the first to mass produce automobiles in the US. Ransom Olds (of Oldsmobile) beat him to the punch in that area. Henry Ford was just the more successful, primarily because of his relentless attack on**waste**.

  [Learn More About This Term...](#)

- **Hidden Factory (Hidden Process)**

 A hidden factory is the set of undocumented and unstaffed **processes** that are done in an organization.

  When you dive into a process, you will often find two methods of doing it. The first is the documented method, or the one described by the **operator** as what he or she does. This is often the method that is used for timing, and ultimately for planning the capacity of an operation.

  Learn More About This Term...

- **Histogram**

  A histogram is a specialized form of bar chart that shows the distribution of the data it is representing.

  Each bar represents a uniform range of data values, with the height of the bar showing the number of occurrences that fall into that range.
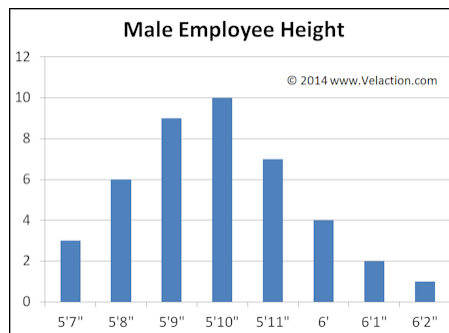
  Learn More About This Term...

- **Hoshin Kanri**

  Hoshin kanri is a Japanese term meaning policy deployment or strategic planning.

  Learn More About This Term...

- **How You Think Links**

The "How You Think Links" model depicts an overview of the process that a person typically follows to progress from an event occurring to taking action and ultimately, to getting a result.

The basic steps are:

  o **Event**
  o **Interpretation**
  o **Emotion**
  o **Decision**
  o **Action**
  o **Result**

Learn More About This Term...

"I" TERMS

- ## Implementation

  An implementation is simply the act of putting a plan into effect. It can also refer to a change in a strategy or a system.

  In **continuous improvement**, the term 'implementation' commonly refers to **Lean** as a whole, or can mean implementing the system-based tools, such as **pull**, *kanban*, or **standard work**.

  Learn More About This Term...

- ## Important vs. Urgent (+ 9-Page PDF)

  Distinguishing between important and urgent can mean the difference between spending all your time firefighting, and being able to move on to fire prevention. Learn more and download a FREE 9-Page PDF on importance and urgency.

  Learn More About This Term...

- ## Improvement, Daily

  See also Daily Improvement.

  Learn More About This Term...

- ## Improvements

  Improvements are simply changes for the better. **Lean** and other **continuous improvement** philosophies all focus on using some sort of problem solving method to drive improvement. Improvements can range from new, better computer systems, to *kaizen* events, on down to moving a garbage can closer to the point of use.

  Learn More About This Term...

- **Indicators**

  Monitoring indicators give companies a sense of what is going on, or what is going to happen.

  An indicator is a signal that can be used to understand or predict a behavior of a person or system. A poker player has 'tells'. By identifying and monitoring those indicators, his opponents try to predict the player's behavior.

  Learn More About This Term...

- **Indirect Costs**

  Indirect costs are those expenses that are not directly attributable to a single**cost** center or cost object (product line, service, etc.) Indirect costs may include shared resources or overhead.

  Learn More About This Term...

- **Industrial Discipline**

  Industrial discipline is the act of doing the right thing on the **shop floor**. Industrial discipline means practicing **5S** and putting tools away, using *andons*and reporting **problems** even if they make you look bad, and following**Standard Work** every time.

  Learn More About This Term...

- **Information**

  Information is application of data in context. Information also has the element that it can be acted upon. The weight of an elephant, for example, is a piece of data. Knowing if a bridge is strong enough for the elephant to cross is information.

  Information can be costly to acquire. Generally speaking, the harder a piece of information is to learn, the more of a competitive advantage it bestows. When everyone knows something, there is often no way to use the information in a unique way.

  Learn More About This Term...

- **Information Technology (IT)**

  Information Technology (also known as IT) is the group primarily responsible for maintaining a company's **computer** and communications systems.

  Information Technology groups are also responsible for selecting, installing, updating, training, and troubleshooting the software systems in a company.

  Learn More About This Term...

- **Initiative**

  Initiative is taking action on one's own. It generally involves going above and beyond a typical job description, or working outside of one's functional area.

  Many bosses want employees to take more initiative, especially in Lean companies, but fail to establish some of the basic prerequisites.

  Learn More About This Term...

- **Inputs**

  Inputs are the factors that are necessary to complete a **process**. They may be environmental (heat, humidity), labor, material, or anything else that is required.

  Some inputs, though, are not intentional—the proverbial 'flies in the ointment'. Controlling these inputs is critical to delivering high quality results from a process.

  Learn More About This Term...

- **Inspections**

  An inspection is a review to confirm the **quality** of a product. Inspections vary widely in their formality, and in the location where they are done.

  The closer an inspection is to the point where an **error** is made, the quicker the problem can be corrected.

  Learn More About This Term...

- **Intangibles**

  Intangibles are those things that are not clearly perceptible. Many of the benefits of Lean appear, at first glance, to fall into this category.

  Upon deeper consideration, though, you will likely find that many intangibles can actually be measured. 'Morale' seems intangible, but can be measured by turnover, satisfaction surveys, or even the quantity of laughter in the company.

  [Learn More About This Term...](#)

- **Intelligence**

  Intelligence is one of the many facets of 'smartness' Intelligence is the capacity to learn. It doesn't always translate into actually possessing knowledge. Having the capacity to learn does not mean that one has actually learned.

  Intelligence is a highly valued trait in Lean, as continuous improvement works best in a learning organization—one that assesses shortcomings, and seeks understanding about why problems happened. People are also often asked to use new tools or work outside their comfort zone, both of which benefit from intelligence.

  [Learn More About This Term...](#)

- **Intermittent Problems**

  Intermittent problems are simply ones that don't occur every time a **process** is performed. The inconsistency with which intermittent problems present makes them extremely hard to resolve.

  The most common form of intermittent problem is the computer glitch. Something happens once, and then the **problem** goes away for a while.

  [Learn More About This Term...](#)

- **Internal Setup**

  An internal setup is a task done to get a machine ready to switch from one product to another that must be done when the machine is stopped. Obviously, the problem is that internal setup limits the time a machine can be running.

  As part of any setup reduction effort, improvement teams should first try to change any internal setup to an external setup, meaning it can be done while the machine is running. While this can make the setup take longer, the additional time is spent while the machine is running, so it doesn't impact the throughput of the machine.

  Learn More About This Term...

- **Internal Suppliers**

  A supplier who is a part of the same company as ists customer is an internal supplier. They may providers products or services. They are the upstream processes and the support groups that provide their coworkers with the tools to do their jobs.

  Internal suppliers and customers often have a rocky relationship. Because no money is changing hands, their customers don't limit what they ask for. There is little way for an internal supplier to really understand what is most important to their customers. External customers, because they speak with their wallets, show their priorities in what they are willing to pay for.

  Learn More About This Term...

- **Interruption Log**

  The Interruption Log helps team members identify the various sources of distraction that disrupts their work flow throughout the day.

  Format: XLSX

  Regular Price: Free for Registered Users

  Learn More About This Term...

- **Interviews vs. Interrogations**

  In **continuous improvement**, you often have to go out and collect **information**from people. Sometimes it is from **observations**. Often, though, you will be speaking directly to people doing the process, and you will be asking them questions.

  Keep in mind one important distinction. Interviews generally seek answers. Interrogations seek confessions. Don't go into an interview with the intention of figuring out who is at fault for a problem.

  Learn More About This Term...

- **Inventory**

  Inventory is the collective term for finished goods that you intend to sell, and the components that go into those goods.

  Inventory is a necessary evil of production. Without inventory, nothing could be built, and nothing could be sold. But too much inventory drives up costs. Inventory must be stored, managed, moved, and insured. Obsolete inventory must be disposed of. Large quantities of inventory require large warehouses, forklifts, and staff. Plus there is, of course, the capital (invested money) that goes into purchasing the inventory in the first place.

  Learn More About This Term...

- **Investments in People**

  Investments trade current resources for future gains. The most common forms of investment include:

  - Financial holdings designed to provide a return on investment (ROI) in the form of appreciation, dividends, or interest.
  - Physical holdings intended to appreciate or generate income, such as real estate
  - Physical items used to create other products or provide services, such as software systems or CNC machines

  Learn More About This Term...

- **Issues**

  Although this is not specifically a Lean term, 'issue' is a starting point for many forms of Lean problem solving. An issue is much like a 'problem'. It looks like a problem. It smells like a problem. It feels like a problem. Only, it's not a problem. It's an issue.

  Learn More About This Term...

"J" TERMS

- **Jidoka**

  The most common definition of *jidoka* is 'autonomation.' It is **Japanese in origin**, as are many specialized words in Lean. *Jidoka* traces its roots back to the early 1900's at **Toyota in Japan,** then a textile manufacturing company. Sakichi Toyoda, an inventor and the founder of Toyota , developed a device that could detect broken threads in a loom and stop the machine from producing defective material. This concept, in which intelligence was added to machines, enabled companies to greatly increase the number of machines a single**operator** could run—with very little extra effort on the worker's part! With*jidoka*, production becomes much easier for operators and much more**profitable** for companies.

  Learn More About This Term...

- **Job Descriptions**

  Job descriptions exist for nearly every position in nearly every company. They outline the overview of the job, responsibilities, work activities. They should also list job requirements, and clearly spell out which are mandatory, and which are 'like-to-haves'.

  Job descriptions are most commonly used for recruiting purposes or during annual reviews.

  Learn More About This Term...

- **Job Rotation**

  Job rotation is an important concept in **Lean**. Simply put, it is the act of periodically moving people around to different tasks, accounts, or workstations. The rotation may be on a set schedule, or on an ad hoc basis.

  Cross-training is a prerequisite for successful job rotation.

  Learn More About This Term...

- **Job Satisfaction (+ 9-Page Lean PDF)**

Job satisfaction is important in any company, but it carries even more weight when a company is focused on continuous improvement. Employees are expected to take the initiative and they won't if the are dissatisfied. Download a FREE 9-Page PDF to learn more about job satisfaction.

Learn More About This Term...

- **Job Security**

Job security is the feeling of safety that one's job will be there in the future. Because job security is so closely linked to basic needs, like shelter and food, people react with strong emotions when their job security is threatened. In fact, job security falls into the first level of Maslow's Hierarchy of Needs.

On the surface, Lean and other continuous improvement efforts seem to be contrary to a person's job security. Often, managers are excited about the prospect of improved productivity and faster employees, which loosely translates to workers as, "We won't need as many of you to work here."

Learn More About This Term...

- **Job Shop (+ 11-Page Lean PDF)**

Applying Lean to a job shop can be a challenge, but it is also well-worth the effort. Visit this Lean term page to learn more and download a FREE 11-Page PDF about Lean job shops.

Learn More About This Term...

- **Just-In-Case**

  Just-in-case is a play on words of **just-in-time manufacturing**. Contingencies are one of the main reasons why people do many of the non-Lean activities that hurt an organization.

  - Holding **inventory** just-in-case a shipment is late
  - Batching some extra just-in-case there is a **problem**
  - Buying an extra machine just-in-case it breaks down
  - Having a big safety stock just-in-case there is a quality problem

  Learn More About This Term...

- **Just-in-Time Manufacturing**

  Just-in-time manufacturing is the method of producing products with only a minimal amount of raw material and component parts on hand.

  The concept of just-in-time manufacturing is nothing new. **Henry Ford** saw value in having a minimal amount of stock on hand—a concept which **Taiichi Ohno** took to heart as he developed the **Toyota Production System**. In fact, Just in Time manufacturing is one of the central pillars of the **Toyota Production System**.

  Learn More About This Term...

"K" TERMS

- ## **Kaikaku**

  Kaikaku is revolutionary change. Where *kaizen* is generally evolutionary in nature, *kaikaku* requires radical shifts in thinki ng.

  Revolutionary changes tend to be far more challenging in nature and much less common than incremental improvement. Because of the broad, sweeping changes that *kaikaku* brings, it is generally driven by higher level leaders, and requires the commitment of greater continuous improvement resources than everyday improvements. It can also be hard for frontline employees to embrace the major changes that *kaikaku* brings.

  Learn More About This Term...

- ## **Kaizen**

  What is the meaning of *kaizen*? No translation is perfect, but *kaizen* is a Japanese word that roughly translates to 'change for the good'.

  Learning how to implement *kaizen* concepts properly goes a long way towards improving your job satisfaction in a Lean company. Why? Because you might be asked to participate in a *kaizen* blitz, a Lean event, a rapid improvement workshop (RIW), a rapid improvement project (RIP), or something else with a similar name. These all fall into one big bucket that covers the most common way people think of *kaizen* concepts: putting together a team of people from several work areas to do a week-long project to reduce waste or improve a process's flow.

  Learn More About This Term...

- ## **Kaizen Audit Form**

  The Kaizen Audit Form is a tool to help sustain the gains made in a rapid improvement project. Without a sustainment plan, it is easy for teams to backslide.

  Format:XLSX   **Regular Price:** Free for Registered Users

  Learn More About This Term...

- **Kaizen Charter Form**

The *Kaizen* Charter Form helps team leaders organize for rapid improvement projects. It contains team information, the scope, and the targets of the *kaizen* event.

Format:XLSX   **Regular Price:** Free for Registered Users

Learn More About This Term...

- **Kaizen Checklist**

The *Kaizen* Checklist helps team leaders manage the planning of improvement projects. It contains weekly tabs to keep from missing important milestones of the *kaizen* events.

Format:XLSX   **Regular Price:** Free for Registered Users

Learn More About This Term...

- **Kaizen Event (+ 11-Page PDF)**

Kaizen events are typically week-long, focused projects in which a team makes substantial changes to a process. Learn more and, and download a FREE 11-Page PDF on *kaizen* events.

Learn More About This Term...

- **Kaizen Kit**

  Kaizen kits are packages of tools and supplies that support **continuous improvement** activities. The purpose of the kit is to streamline the **kaizen**process by having necessary tools and supplies gathered in advance.

  The kit, if properly stocked with "artsy and craftsy" materials, or with tools that they would not otherwise think of, can also inspire **creativity** in teams.

  Learn More About This Term...

- **Kaizen Newspaper Form**

  The *Kaizen* Newspaper is a tool to help manage tasks during and after a*kaizen* project. Because of the fast pace of projects and the ad hoc schedule, communication can be a challenge. This tool helps teams stay synced up as they work to make improvements.

  Format:XLSX

  Regular Price: Free for Registered Users

  Learn More About This Term...

- **Kanban (+ 11-Page Lean PDF)**

  Kanban is a powerful inventory management tool that provides the stability required to improve operations. Visit this Lean term page to download a FREE 11-Page PDF about *kanban*.

  Learn More About This Term...

- **Kanban Card (+Form)**

Part Description			Part Number	
Smoke-shifter, left handed.			14613	
Qty	20	Lead Time	1 week	Order Date	9/3
Supplier	Acme Smoke-Shifter, LLC		Due Date	9/10
Planner	John R.	Card 1 of 2		
		Location	Rack 1B3	

The *kanban* card is a tool used to manage inventory. Its power lies in its simplicity and its visual nature.

Format:XLSX

Regular Price: Free for Registered Users

Learn More About This Term...

- **Key Performance Indicator**

KPI stands for key performance indicator. KPIs are the specific, quantifiable measures by which an organization evaluates its success.

KPIs come from two main sources. The first is that they can cascade down from**policy deployment** and are linked to an improvement target. In that situation, a key performance indicator is the little slice of a strategy that a subordinate organization must accomplish if the company is to meet its overall goals.

Learn More About This Term...

- **Kitting (+ 5-Page Lean PDF)**

Kitting is a production technique that helps to control inventory as well as to prevent mistakes that come from installing too many or too few parts. Visit this Lean term page to learn more and download a FREE 5-Page PDF about kitting.

Learn More About This Term...

- **Knowledge**

  Knowledge is the body of facts and information surrounding a specific topic. That topic can be a about **processes**, company policies, knowing who to speak with to get things done, or general skills. In fact, it can be about practically anything.

  Knowledge has the trait of specificity. That just means that it is relevant only in certain situations. A very smart person without specific knowledge can be very ineffective. Likewise, an uneducated person who knows which dial to turn can be vital.

  Learn More About This Term...

- **Knowledge Management (+9-Page Lean PDF)**

  Knowledge management is the method by which collective wisdom of an organization is preserved and shared. Learn more and download a FREE 9-Page PDF on knowledge management.

  Learn More About This Term...

- **KPI Bowler**

  The KPI Bowler is a tool used to track progress against established goals. It should contain all the major metrics of the organization, usually organized by Quality, Cost, Delivery, Safety, and Morale (QDCSM).

  Format: XLSX   **Regular Price:** Free for Registered Users

  Learn More About This Term...

"L" TERMS

- **Large Numbers, Law Of**

  In statistical terms, the law of large numbers is a theor em that postulates that as the size of the sample of a **random** variable increases, its average will approach the theoretical average. In layman's terms, the law of large numbers simply says that over time, the more times you roll a dice, the more likely the average of the rolls will turn out to be 3.5.

  If your sample size is one, meaning a single roll, you have a 2 in six chance of getting a 3 or 4, both close to the average. But you also have a 2 in six chance of being as far away from the expected average as possible by rolling a 1 or a 6. Also note that there is no chance of rolling a 3.5, the theoretical average, with a single dice.

  Learn More About This Term...

- **Last-In, First-Out**

  In accounting, last-in, first-out (LIFO) is a method of recording **inventory**. It is used to manage earnings in inflationary times. A last-in, first-out inventory system records the most recent price of materials as the cost, thereby lowering earnings. As a result, the older items, purchased earlier when prices were lower, remain on the books.
  In **Lean** systems, with low inventory, this has lower impact.

  Learn More About This Term...

- **Layoffs**

  Layoffs, also called downsizing, are mass terminations of employees because of a lack of work.

  Layoffs pose a significant risk to **Lean** and other continuous improvement efforts. If employees get the idea that helping make improvements will cost them their jobs, then they will not want to make things better.

  Learn More About This Term...

- **Layouts**

  Facility layouts come in three basic flavors.

  0. **Unplanned Layouts.** Some facilities are not arranged by any master plan. As new machines are needed, they are placed where they will fit. It is fairly uncommon for this method to be used throughout an organization, but many will have a few machines that are obviously placed where there was space.
  1. **Functional Layouts / Process-Oriented Layouts.** This layout style is characterized by groupings of similar **processes** that serve multiple product lines. For example, there may be a welding cell, a stamping cell, and a machining shop. It is the traditional way facilities are organized.
  2. **Product-Oriented Layouts.** In this layout, machines and work areas are positioned sequentially based on the steps required to build a particular product. The closer the machines are, the easier it is to implement **flow**. This layout often utilizes small, right-sized machines instead of large multi-purpose systems.

  Learn More About This Term...

- **Lead Time**

  In the most common definition, lead time is the time that elapses from when a **customer** places an order until the order is received.

  Some variations on the definition of lead time look at the time from when a raw material arrives at a facility until the finished product ships.

  Learn More About This Term...

- **Leader's Intent**

  The military has a term called "commander's intent". It is a part of every mission briefing in which the commander describes success and the purpose behind what he or she wants to achieve.

  Unfortunately though, in any combat operation, there is a chance that a unit will find itself without its **leader**. Whether a simple, temporary communications glitch, or a serious injury or death, there can be a sudden **leadership** vacuum.

  Learn More About This Term...

- **Leaders**

  Leaders are the people who can envision a destination and inspire a group of others to join them on the journey to that goal.

  Leadership can be both formal and informal. In formal leadership roles, the leader is designated by someone of higher **authority** to act in that capacity. The role may be a permanent position, or it may be a temporary assignment, such as a *kaizen* leader.

  Learn More About This Term...

- **Leadership**

  In short, leadership is the act of one person uniting and motivating others toward a common goal.

  Leadership is part natural (as in "natural-born"), but is refined greatly through **training**, practice, and constant learning. Confidence in oneself is a key component of leadership.

  Learn More About This Term...

- **Lean (+Video)**

  In its original definition, Lean is a form of **continuous improvement** that springs from the **Toyota Production System** (TPS). The term 'Lean' was popularized in the landmark book, *Lean Thinking*. It focuses on improving **flow**, with a heavy emphasis on reducing inventory.

  Nowadays, though, there is also a broader definition. Lean has come to mean any effort to do more with less. For some, it has even become interchangeable with the terms 'waste reduction', 'continuous improvement', or '**process improvement**'.

  Learn More About This Term...

- **Lean Accounting**

  Accounting is a necessary part of any business. It is critical to know if the actions a company is taking are making it profitable, or if they are causing the business to bleed cash. Accounting in the best of situations has its challenges. But the advent of lean has made for some tricky situations in which traditional accounting methods may actually show Lean efforts as having a negative impact on financial performance.

  This is most pronounced in the methods traditional accounting uses to account for inventory and for standard costs. For example, traditional accounting shows that lower standard costs mean more profit. Lean accounting, however, understands that creating flow through setup reduction and running smaller batches will increase standard costs, but reduce overall costs of production.

  Learn More About This Term...

- **Lean Implementation**

  A **Lean** implementation is the initial period of time when a company or organization is putting Lean in place.

  While most people look at it as a discrete event, in truth, there is often a long period where different parts of an organization are rolling out Lean. So, different departments within the company may be at different stages in their Lean implementation.

  Learn More About This Term...

- **Lean Manufacturing (+Video)**

  Lean manufacturing is the business philosophy of relentlessly eliminating **waste** to improve **flow** in a production environment.

  Lean manufacturing has evolved into something far more widespread, and now Lean encompasses **offices**, construction, service, hospitals, and even government.

  Learn More About This Term...

- **Lean Office (+14-Page Lean PDF +Video)**

  Despite its reputation as a shop floor philosophy, Lean has migrated to office environments. While there are variations on how it is applied, it has unquestionably passed its infancy, and is providing stellar improvements to administrative operations. Visit this Lean term page to download a FREE 14-Page PDF about the Lean Office.

  Learn More About This Term...

- **Lean Six Sigma**

  Lean Six Sigma is the combination of **Lean** and **Six Sigma** into a single business philosophy.

  Lean is commonly thought of as a way to improve **process** speed. Six Sigma is primarily considered a **quality** tool. In truth, though, the two both share a lot of the same tools, and both focus heavily on **problem solving**.

  Learn More About This Term...

- **Lean Tools**

  Lean tools are the individual components of a Lean system.

  The most common Lean tools are:

  - **5S**
  - **Countermeasures**
  - ***Jidoka***
  - ***Kaizen***
  - ***Kanban***
  - **Pareto (80/20) charts**
  - **Process flow charts**
  - ***Poka yoke***
  - **Pull /Just In Time Manufacturing**
  - **Single Minute Exchange of Die (SMED)**
  - **Standard Work**
  - **Total Productive Maintenance**
  - **Value stream maps**
  - **Visual controls**

  Learn More About This Term...

- **Level Loading**

  Level loading, also known as ***heijunka***, is the practice of using demand estimates to establish an average production level.

  By smoothing the demand, Lean companies can standardize their processes better, and can match their **capacity** to the current needs of the customer. Level loading on a mixed-model production line balances the mix of products in addition to the total demand by specifying a standard sequence of models. (i.e. ABABC ABABC)

  Learn More About This Term...

- **Line Balancing**

  Line balancing is the act of balancing the **cycle times** of the workers on a production line to the *takt* **time**.

  When everyone has a cycle time that matches the *takt* time, work **flows**efficiently. If a line is not balanced, it either has waiting **waste** where team members are standing around at the end of each cycle, or the line can't keep up with demand.

  Learn More About This Term...

- **Line Shift**

  A line shift is a synchronized movement of all the production work on an**assembly line**. It can be done in several ways.

  - Manually, in which each person pushes their work to the next station on a signal.
  - On an indexed moving line, in which the line moves and then stops. The movement may be triggered manually, or automatically.
  - On a continuously moving line, in which the movement of the work units never stops. Rather, the conveyor crawls along as a snail's pace past the assembly workers.

  [Learn More About This Term...](#)

- **Line Stop (+5-Page Lean PDF)**

  Line stops are an important part of both protecting quality and investigating problems in real time. Lean more and get a 5-page Line Stop Lean Term on PDF.

  [Learn More About This Term...](#)

- **Little's Law**

  Little's Law is a basic mathematics equation for calculating lead time. In the layman's version, it says:

  Lead time = Number of units in WIP / Average Production Rate

  [Learn More About This Term...](#)

- **Low Hanging Fruit**

   Low hanging fruit describes the big bang for the buck projects that can jump-start a **Lean implementation**.

   They are the **problems** and opportunities that are easy to address with relatively little effort.

   Learn More About This Term...

- **Luck (+ 6-Page Lean PDF)**

   Luck plays a role in the success of your organization, but it is possible to stack the deck in your favor and prepare for bad luck. Visit this Lean term page to learn more and download a FREE 6-Page PDF about luck in Lean operations.

   Learn More About This Term...

"M" TERMS

- **Machine Cycle Time**

  Machine cycle time is the time a machine actually requires to produce one unit of output.

  Machine cycle time has three basic components. It has the time to load the machine, the actual **machining or machine time**, and the unloading time.

  Learn More About This Term...

- **Machining Time / Machine Time**

  Machining time (or machine time) is the time when a machine is actually processing something. Generally, machining time is the term used when there is a reduction in material. For example, in a drill press, machining time is when the cutting edge is actually moving forward and making a hole. Machine time is used in other situations, such as when a machine installs screws in a case automatically.

  The machining time, combined with the loading and unloading time, yields the **machine cycle time**, or the amount of time that the machine must commit to each part, once it is set up to run that product.

  Learn More About This Term...

- **Maintenance, Total Productive**

  See also Total Productive Maintenance.

  Learn More About This Term...

- **Manager**

  A manager is a person in a formal position of **authority**, generally responsible for guiding a team or process towards an established goal.

  In virtually all cases, a manager is in a formal position, as opposed to a **leader** who may be in either a designated or an informal role.

  Learn More About This Term...

- **Manufacturing, Just-in-Time**

  See Just-in-Time Manufacturing.

  Learn More About This Term...

- **Marketing**

  Marketing is the combination of art and science used to determine which products or services a **customer** will buy, and then crafting a message to make them more appealing.

  There is a veritable library of information available on marketing, so this term focuses on the impact **continuous improvement** efforts can have on marketing efforts.

  Learn More About This Term...

- **Maslow's Hierarchy of Needs**

  Abraham Maslow (1908-1970), is a psychologist made famous by his Heirarchy of Needs. He proposes that people have a tiered structure of needs, and the most basic of these must be met prior to dedicating attention to more advanced, or higher-order needs. The hierarchy, from lowest to highest, includes:

  0. *Physiological Needs***:** These are the core needs shared by all living things—food, water, reproduction, etc.
  1. *Safety Needs:* Safety has changed in its meaning over time. Most people don't fear the saber-tooth tiger anymore, but do fear unemployment, or loss of autonomy, or change.
  2. *Love/Belonging Needs:* People need to feel like a part of something—softball team, family, cult—whatever fills this need.
  3. *Esteem Needs:* People want to be respected. They need to feel a sense of accomplishment.
  4. *Self-actualization***:** People want enlightenment. The drive for excellence in **problem solving** and continuous improvement efforts, as well as**creative** expression falls in here.

  Learn More About This Term...

- **Master Black Belt**

  A Master Black Belt is an individual who has been certified to train other black belts. Black belts are the trainers and continuous improvement team coaches for a company.

  Learn More About This Term...

- **Mean (Average)**

  The average or arithmetic mean (commonly just called the mean) is a measure of the central tendency of a sample. In layman's terms, this is simply a way of describing what a representative item from a group would look like.

  The arithmetic mean is calculated by dividing the sum of the elements in the sample by the number of elements.

  The formula is…

  Arithmetic mean = element 1 + element 2 + … + element n / n

  Learn More About This Term...

- **Median**

  The median is the point at which there are the same number of values above it as there are below it. This can apply to a sample, a full population, or distribution curve.

  When the data consists of a finite set (rather than a distribution curve), if there is an even number of data points, the median is the average of the two middle points.

  Learn More About This Term...

- **Meetings**

  Meetings are a gathering of more than one person to discuss a specific topic.

  Well planned meetings have an agenda, a meeting manager who keeps the meeting on track, and a set objective.

  Poorly planned meetings generally miss out on one or more of those components, and as a result tend to **waste** the time of the attendees.

  Learn More About This Term...

- **Memory**

  What did you have for breakfast last Tuesday? How many eggs are left in your refrigerator?

  If you had any trouble answering those questions, you will understand why memory is not a reliable tool for processes. People get distracted and skip steps. Requiring people to remember counts can be especially disastrous. It is easy to lose one's place and come up

with the wrong number, especially when the counts are highly repetitive (i.e. counting the number of items to put into a 10-pack).

Learn More About This Term...

- **Mentor**

  A mentor is an experienced, wise counselor. The mentor must be trusted by the student.

  This often precludes mentors from being in direct supervisory roles. People often feel cautious about sharing too much personal information with bosses.

  Learn More About This Term...

- **Metrics**

  Metrics are the measurements that companies use to help a team meet its**goals**. Metrics are formal. They should be clearly defined and tracked regularly.

  More importantly, metrics should be acted upon. Tracking information without doing anything with it is demoralizing to teams, and consumes resources that can be used better elsewhere.

  Learn More About This Term...

- **Micromanagement**

  Micromanagement is the act of giving excessive instructions to employees. It tends to reduce the **effectiveness** of an organization for a variety of reasons.

  0. If a manager is micromanaging an employee, he is not doing his own work, limiting his effectiveness.
  1. If a manager micromanages, her employees will be reluctant to take on challenges. They will fear reprimands if they do not do things exactly the way the boss would do it.
  2. Employees tend to have lower **job satisfaction** when they are not in control of their work. And this lack of control can lead to health issues, as determined by a University of Texas study (Men's Health, April 2008).
  3. **Lead times** to make **decisions** get longer, as employees need their manager's approval before taking action.

  Learn More About This Term...

- **Milestones**

  Milestones were originally the stone markers along a route that told travelers the mileage. In modern times, milestones serve the same function for projects.

  Milestones are specific, definable points on a project that are used to indicate progress. If the milestones are vague, they are hard to tell when they are reached.

  Learn More About This Term...

- **Mistake Proofing**

  Mistake proofing devices, also called *poka yokes*, are the most effective way to improve **quality**. In a nutshell, a **process** or product is designed in which a mistake is impossible.

  This problem prevention is targeted at specific **errors**. In order to mistake proof a process, one must have an understanding of the way the process can fail. Mistake proofing can be done proactively by considering likely quality problems, or it can be done reactively as a **countermeasure** to actual quality issues. A single process step may have multiple mistake proofing devices built into it if there are many ways the process can fail.

  Learn More About This Term...

- **Mode**

  The mode is the number which appears most frequently in a set of numbers. For a finite data set, as in a sample of measurements, the mode would be the number that appears the greatest number of times.

  Learn More About This Term...

- **Monuments**

  Lean operations strive to move materials through **processes** in the smallest quantity possible. As a **value stream** approaches **one piece flow**, inventory tends to drop and **productivity** rises.

  Unfortunately, this streamlined flow is often interrupted by large, fixed pieces of equipment that are difficult to move or replace.

  Learn More About This Term...

- **Morale**

Morale is simply the attitude you have about work. Good morale means people are **satisfied with their jobs** and are willing to commit to the success of the company.

With poor morale, people feel like the company is an adversary, and are reluctant to engage in much more that the minimum tasks necessary to keep their jobs.

Learn More About This Term...

- ### **Motion Waste (+Video)**

The waste of motion is one of the **seven wastes** attributed to **Taiichi Ohno**, the father of modern **Lean**.

Motion is, simply put, moving more than necessary when doing work. It can be large motions, such as walking between work areas, or small motions, such as flipping a screwdriver over after pulling it from a shadow board.

Motion waste also occurs in office environments. Walking to printers and fax machines, excessive clicking, or searching for supplies in a messy cabinet are all examples of wasted motion.

Learn More About This Term...

- ### **Motivation (+ 7-Page PDF)**

Motivation is the disposition to act, and to stick with something. Motivation can be either internal or external. The term self-motivation means that a person is able to keep momentum up on her own. External motivation comes from someone else. Great speakers and leaders can inspire people to take action.

Learn More About This Term...

- ### **Muda (Waste)**

Many **Lean** terms originate from Japan. *Muda* is one of those terms. It really translates to 'wasteful activity', but in common practice most people simply use this definition: *muda* = waste.

Since one of Lean's main goals is reducing waste to improve **flow**, it is no surprise that *muda* had a major role in Lean. If there was a single battle cry for Lean, it would be 'No *Muda*!'

Learn More About This Term...

- **Muda, Muri, Mura**

  Like many Japanese terms surrounding **continuous improvement**, there are several slight variations of translations of these three terms. In general, *muda* is the most commonly used of this group of terms. In practice, it has come to mean '**waste**'. *Muda* really means wasteful activity. *Mura* means the waste of inconsistency or unevenness. *Muri* is the waste of strain or unreasonableness.

  Learn More About This Term...

- **Mura**

  Mura is one of three Japanese terms meaning **waste**. The others are *muda*, the traditional form of waste in which resources are not effectively used, and *muri*, meaning overburden or overexertion.

  Mura means inconsistency or excess **variation** in either **processes** or **demand**. When processes are not standardized, each different method adds wasted movement to a process. It also creates a large potential for quality problems.

  Learn More About This Term...

- **Muri**

  Muri is a Japanese term for a specific form of **waste**. It means unreasonableness or overexertion. It is often referred to with two other Japanese terms, *muda* (the traditional view of waste in which resources are used without adding to output) and *mura* (**variation** in methods and **demand**).

  When people and machines are pushed beyond a reasonable limit, they tend to have diminishing performance, as well as increased costs. In the case of machines, *muri* causes faster wear and tear, **quality** problems, and catastrophic breakdowns.

  Learn More About This Term...

- **Murphy's Law**

  Murphy's law has been said in various ways, but essential boils down to "If something can go wrong, it will." There are many addendums to the law, such as 'in the worst possible

way' or 'at the worst possible time.' The origin of Murphy's law is somewhat murky, but seems to involve an engineer named Edward Murphy and a failed test on g-forces. There are earlier references to a similar law dating back to 1928.

Murphy's Law is rooted in the fact that we tend to take notice of the things going wrong more often than the things going right. People are far more likely to comment about bad traffic than about times traffic was flowing well. We seldom come home and say, I didn't have an accident today, but you can bet you'd talk about it if you did. Murphy's law sticks around because of this focus on the negative.

Learn More About This Term...

"N" TERMS

- **Nagara**

  Nagara is a Japanese term meaning 'while doing something'. It simply means to do more than one thing at a time. For example, a two parts may be fitted together as they are clamped into a welding fixture. Or, a person may be able to assemble two parts while walking.

  In practice, though, the application of the *nagara* principle is limited. In most cases, a **process** takes a person's full attention. Operating a piece of machinery while doing something else can even be **dangerous**. It takes some careful process design to combine tasks.

  Learn More About This Term...

- **Names**

  Remembering someone's name tells them that you place value on them as an individual. It shows that you **respect** them enough to remember who they are. Unfortunately, many, if not most, people have an extremely hard time remembering names of people they see only periodically.

  Learn More About This Term...

- **Negotiation**

  Negotiation is simply the **process** of discussing something of mutual interest and agreeing to terms. Negotiations typically involve tradeoffs. One side gives something of value to the other site to get something of value in return.

  Negotiations may be conducted for a one-time transaction, or for an ongoing relationship.

  Learn More About This Term...

- **Net Present Value**

  Net Present Value (NPV) comes from the principle that money today is worth more than money tomorrow.

  Would you rather have $1,000 today or $1,000 in 5 years? That question is easy to answer. Most people would take the money immediately.

  Learn More About This Term...

- **New Product Developement (NPD)**

  NPD is perhaps the most critical of all business functions. Think of a business like a shark. It has to keep moving forward to stay alive. NPD is the process by which they keep moving forward.

  Customers get bored with the current product or need a product to solve a new problem change. Or perhaps other businesses come up with their own new ideas. Whatever the cause, one thing is certain. Companies that produce goods but have nothing new in the pipeline are at a significant disadvantage to their competition.

  Learn More About This Term...

- **Night Shift**

  A night shift is just what it sounds like. It is the second (or third) shift at a facility after the normal day shift ends.

  A night shift usually exists for one of two reasons. In production environments, a night shift adds **capacity**. This is very useful for production requiring large amounts of space or excessive capital.

  Learn More About This Term...

- **No-No's of Lean Operations**

  Continuous improvement is as much about not going backward as it is about making progress. Knowing what to avoid is as important as knowing what to do. While many of the items on this list of No-No's won't derail your **Lean** efforts, they do act as speed bumps that slow down progress. Improvement resources are in short supply. Make sure they are not wasted on known obstacles.

  Learn More About This Term...

- **Noise (Sound) (+ 5-Page Lean PDF)**

Excessive noise can cause hearing damage, but even below that threshold, it can hurt job satisfaction. Noise is also often an indicator of problems. Visit this Lean term page to learn more and download a FREE 6-Page PDF about noise in Lean operations.

[Learn More About This Term...](#)

- **Noise to Constant Sheet**

The Noise to Constant Sheet is a tool used to identify opportunities to remove special cause variation from processes.

Format: XLSX   **Regular Price:** Free for Registered Users

[Learn More About This Term...](#)

- **Nominal Conditions**

A key requirement in a **Lean** operation is to make **abnormal conditions** stand out. Obviously, to recognize abnormal, you must also understand what normal is. Nominal conditions define your **standard** and let you see that you are operating within acceptable limits. Note that the term "nominal conditions" is not one that is in common use in the Lean community. Regardless, it is an important concept.

[Learn More About This Term...](#)

- **Non-Value Added (NVA)**

  Non-Value Added (NVA) steps consume resources, but do nothing to add value to a product or process. Because value is defined by the customer, non-value added work does nothing to change the **form, fit, or function** of a product into something a **customer** is willing to pay for.

  There is some debate over whether non-value added means the same as **waste**. The difference, if any, is…

  Learn More About This Term…

- **Note Taking**

  Note taking is a valuable skill. Most people can't remember all the details they are deluged with every day. Having a method to record the important morsels of information without getting buried in all the noise can mean the difference between being **effective** at your job and being a black hole for information.

  In meetings, people are constantly taking notes. They jot down a slew of**information**, or type furiously on computers. So, what happens to that info?

  Learn More About This Term…

- **Null Hypothesis**

  "Null hypothesis" is a statistical term that basically means that there is an assumption that there is no statistical difference between observations. For example, the null hypothesis would say that any differences between a sample and a population would be due only to random chance. Statistical testing then confirms or denies whether the null hypothesis is actually true or not.

  Learn More About This Term…

"O" TERMS

- ## Objective vs. Subjective (+MP3)

  Being able to recognize objective vs. subjective informatio n is an important skill for individuals in Lean companies.

  ### *Objective vs. Subjective Definitions*

  - *Objective:* **Information** or **data** that is based in fact. Often numerical. It can be verified by an independent third party. Math tests are generally objective in nature.
  - *Subjective:* Information or opinions that are open to interpretation. Generally, subjective information is seen through the eyes of the person collecting or presenting it. Literature essay tests are subjective in nature.

  [Learn More About This Term...](#)

- ## Observation

  Observation is an important skill for **Lean** and other methods of continuous improvement. It is necessary to document the 'before' **process**, identify **waste**, to conduct **audits**, and to confirm the **effectiveness** of audits.

  Observation is simply the practice of watching a process, preferably several times, to learn about the process.

  [Learn More About This Term...](#)

- ## Obsolescence

  Anything product or service you purchase has a useful life. After that, the value of continuing to use it declines until it makes sense to move to something more modern. The most common example of this is computers. Software becomes outdated at a regular pace as new hardware is developed. New programs are written with greater capabilities, rendering the incumbent program irrelevant. Companies that continue to use the aged software often find themselves operating at a competitive disadvantage.

  [Learn More About This Term...](#)

- **Occam's Razor**

  The common interpretation of Occam's Razor is that when all other things are equal, the **simplest** solution is probably right.

  More accurately, but in less common use, Occam's Razor says that one should choose the hypothesis that makes the fewest new **assumptions**.

  In either case, Occam's Razor is a tool that can be used to assist in **decision making**.

  Learn More About This Term...

- **Off the Shelf**

  The tools, machines, software, or other resources you use to do your job fall into two basic categories. The first type is the most common and contains 'off the shelf' resources. The second category includes custom built or highly modified tools, equipment, or even software.

  Learn More About This Term...
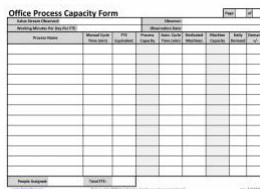
- **Office Politics**

  Office politics are the unwritten rules of interactions in an organization. Social politics form in any group of people that interact regularly. Families have politics. Cliques in schools are a form of politics. And, of course, coworkers have a set of norms that they operate under.

  Office politics are commonly used to gain a personal advantage within the day-to-day operation of the company. That leads to the generally poor reputation office politics has. Getting the corner office, the first crack at overtime, or virtually any other tangible or intangible benefit fall into this category.

  Learn More About This Term...

- **Office Process Capacity Sheet**

  The Office Process Capacity Sheet is a tool used to determine whether the processes and machines in an operation can meet customer demand.

  Format:XLSX   **Regular Price:** Free for Registered Users

  Learn More About This Term...

- **Office Process Questionnaire**

The Office Process Questionnaire helps improvement teams plan what they are going to ask during interviews to make sure they don't miss important information. It als prevent an interview from turning into an interrogation.

Format:XLSX   **Regular Price:** Free for Registered Users

Learn More About This Term...

- **Office Process Recording Sheet**

The Office Process Recording Sheet is a tool used to document the steps in an administrative process.

Format:XLSX   **Regular Price:** Free for Registered Users

Learn More About This Term...

- **Office Process Summary Sheet**

The Office Process Summary Sheet is a tool used to document improvements during a project. It contains spaces to record the 'Before' and 'After' values for a variety of metrics.

Format:XLSX   **Regular Price:** Free for Registered Users

Learn More About This Term...

- **Office Work, Hajek's Law of**

  Today's Gotta Go Lean article comes from a new entry in our **Lean dictionary**…

  Many office work areas don't control the **flow** of work onto people's desks. As a result, individuals may face a small pile of work on one day, and a large pile of work the next.

  Learn More About This Term...

- **Ohno, Taiichi**

  See Taiichi Ohno.

  Learn More About This Term...

- **One-Piece Flow**

  One-piece flow is the method of production in which operators or machines work on single units and pass them along to the next **process** when requested.

  The most common example of one-piece flow is the **assembly line**. An operator at each station works on a unit. All of this work-in process (one unit per operator or automatic machine) moves in synchronization to the next station.

  Learn More About This Term...

- **One-Touch Exchange of Die (OTED)**

  Part of get a **changeover** improved to the point where it is a **single-minute exchange of die (SMED),** is figuring out how to do it with less motion. One-touch exchange of dies is an offshoot of SMED, but is far more aggressive in what it advocates. Where SMED is generally considered to be done in less than 10 minutes (actually a single-digit minute exchange of die), OTED says that with**continuous improvement**, die change should get to the point where they are nearly instant. The one-touch target simply means that the exchange can be done with a single motion rather than multiple steps.

  Learn More About This Term...

- **One-Touch Installation**

Many people are familiar with the concept of **one-touch exchange of dies**, an offshoot of **SMED**. The basically means that there should be a simple, fluid motion to replace dies and **fixtures** in order to minimize setup time. The concept is present in the real world as well. Consider the straps on backpacks. Many years ago, one would have to feed the running end through a buckle and tighten it back on itself. Now, it is simply a matter of inserting one clip into another. One-touch installation takes that concept to the shop floor with the idea that things should be able to be assembled easily.

Learn More About This Term...

- **Operator Cycle Time**

Operator cycle time is the time it takes an operator to do one unit of his or her prescribed work from start to finish. Note that this is elapsed time. The clock starts when the operator begins his work, and ends when he or she is *ready* to start the next unit, regardless of whether it has arrived yet. Operator cycle time will include **waiting time** within the **process** (i.e. standing by a machine, or waiting for a testing sequence to complete.) The actual time an operator is working, meaning that waiting is not included, is commonly referred to as processing time or touch time.

Learn More About This Term...

- **Operators**

The term "operator" is frequently used to describe a shop floor worker in a production environment. While it seems to stem from the use of the term "machine operator", it has been shortened and now is used more universally.

The term is more positive than worker, headcount, or the demeaning 'body'.

Learn More About This Term...

- **Opinions**

Dictionary.com defines an opinion as "*a belief or judgment that rests on grounds insufficient to product complete certainty.*"

In the world of **continuous improvement**, people seldom have the luxury of complete certainty. But, unfortunately, they often act with a clear deficit of**facts and data** to make an informed decision.

Learn More About This Term...

- **Opportunities**

  Problems are generally looked at as a situation in which the current condition does not match the 'should be' state.

  In the traditional sense, the 'should be' state means that something is going wrong. It can occur when **customer** expectations rise, or when performance slips, but in either case, there is a risk of losing something you already have.

  Learn More About This Term...

- **Opportunity Costs (+7-Page Lean PDF +Video +MP3)**

  Choosing one option means giving up the benefit of you other options. Learn more about these opportunity costs and download a FREE 7-Page PDF about opportunity costs.

  Learn More About This Term...

- **Optimization**

  Optimization is the act of making a system as **effective** as possible by adjusting the controllable variables.

  In a nutshell, optimization means figuring out where to set all the controls to make the company, system, **process**, or other aspect of your life do what you want it to do.

  Learn More About This Term...

- **Order Interaction Point**

  The term *order interaction point* refers to the location in the fulfillment process where a specific item becomes attached to a specific **customer**. The order interaction point is, in effect, the crossroads of supply and **demand**. It is the intersection of the sales and the fulfillment processes.

  The term *order interaction point* is seldom used in practice, but the effect of it on an operation is significant.

  Learn More About This Term...

- **OSHA**

  OSHA, or the Occupational Safety & Health Administration, is a part of the US Department of Labor. It was formed in 1970 with the mission of assuring a safe and healthful working environment by setting and enforcing standards. It also provides training, outreach, education, and assistance.

  The underlying mission of OSHA is completely compatible with continuous improvement. Providing a safe and healthy environment is part of showing respect for people.

  Learn More About This Term...

- **Our Process Is Different (+ 5-Page Lean PDF)**

  A common form of push back against Lean is that people think that their process is unique, and that Lean won't work well because of those difference. Visit this Lean term page to learn more and download a FREE 5-Page PDF about why people think their Lean operation is unique.

  Learn More About This Term...

- **Outsourcing**

  Outsourcing is the practice of sending work to another entity (a second company or an individual not employed by the outsourcing company). The main characteristic of outsourcing is that the work contains functions that, up until the outsourcing, had been done by the hiring company. In this manner, it differs from a standard supplier relationship in which the hired company*augments* a capability rather than *supplants* it.

  Offshoring is a specific form of outsourcing in which the company receiving the work is in another country.

  Learn More About This Term...

- **Overproduction**

  Overproduction is one of the **seven wastes** in **Lean**. It is the act of making a product or performing a service before the **downstream** **customer** asks for it. Overproduction is one of the leading causes of excess **inventory**.

  Overproduction is prevalent in **push systems** where **upstream** processes build according to a schedule, and then send the product out regardless of whether their customer is ready for it. Lean deals with overproduction by creating **pull systems**, where products are only built when the downstream customer asks for them.

  Learn More About This Term...

- **Overtime**

  Overtime is the period when an hourly wage earner works beyond his or her scheduled time, usually for an incremental boost in pay. State and federal employment laws govern how overtime can be used.

  Overtime is a useful tool for managing **capacity** spikes. When a few extra orders come in on occasion, it makes sense to use overtime to handle the extra work.

  Learn More About This Term...

- **Ownership**

  Ownership creates responsibility. Whether it is a company, a **process**, or a desk, people tend to take more responsibility when they are dealing with something that is theirs.

  Pride of ownership is a term that is most commonly applied to homes, but it also applies to processes and work areas. When people feel attached to something, they tend to maintain it better. They put a bit more effort towards making it better, and they are less tolerant when entropy sets in.

  Learn More About This Term...

"P" TERMS

- **Pacemaker**

An unlinked production environment is like an accordion. Some processes move faster than the average and some operate more slowly. As a result, parts move through the system at varying speeds, only to end up in piles of **inventory** scattered along the **value stream**.

Even with a *takt* **time** in place, there can still be som e fluctuation in the actual performance of processes, if they are not somehow linked together. This fluctuation gets even more complicated when scheduling is done at multiple places in a value stream. For this reason, a pacemaker is often established. A pacemaker is the single point where a production process is scheduled. The **upstream processes** don't produce without a **pull** signal originating from the pacemaker.

Learn More About This Term...

- **Paradigm / Paradigm Shift**

A paradigm is a framework for thinking about something, usually a scientific or technical discipline. Some examples of a paradigm might be the thought that **big batches** are good on a **machine that has a long setup**, or that **Lean principles do not apply in office environments**.

Learn More About This Term...
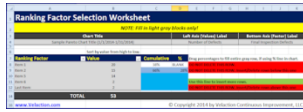
- **Pareto Chart (+ 7-Page Lean PDF, +MP3)**

Learn about Pareto Charts and how the 80/20 rule guides your improvement efforts. Plus, download a FREE 7-Page PDF on Pareto Charts.

Learn More About This Term...

- **Pareto Chart Template**

 This Pareto Chart Template is an easy to learn, easy to use tool for making Pareto charts quickly.

Format:XLSX   **Regular Price:** Free for Registered Users

[Learn More About This Term...](#)

- **Pareto Principle**

The Pareto principle is the result of the work of the 19th Century economist, Vilfredo Pareto. He realized that wealth in Italy was distributed unevenly, and mathematically proved his concept.

Today, the Pareto principle is more commonly known as the 80-20 rule. Simply put, 80 percent of problems are the result of 20 percent of the causes. The power of the Pareto principle is immense. It conserves resources by letting you focus on a small number of issues to eliminate a disproportionally large number of problems.

[Learn More About This Term...](#)

- **Pareto, Vilfredo**

Vilfredo Pareto (July 15, 1848 to August 19, 1923) was an Italian thinker who practiced in many disciplines. He was an engineer and philosopher, but he is most well-known for his work in economics.

[Learn More About This Term...](#)

- **Parkinson's Law (+ 5-Page Lean PDF)**

 Parkinson's Law says that work expands to fill the time available. Learn more in our 5-page Lean PDF file.

[Learn More About This Term...](#)

- **Patterns**

  A pattern is essentially a recurring "thing". It could be behaviors, **defects**, markings, traffic, or anything else that can be observed or monitored.

  The relevance to **Lean** is that the pattern is caused by something. Pure**randomness** is actually surprisingly uncommon in nature, and even less common in the workplace. Nearly everything has a cause if you look hard enough.

  Learn More About This Term...

- **Payback Period**

  Usually used in connection with a **capital investment**, a payback period is the length of time it will take to recoup the amount of money put into a project.

  The exact methodology for determining a payback period varies based on the way **assumptions** are made, and the formula used to do the financial calculations.

  Learn More About This Term...

- **PDCA Cycle (+11-Page PDF, +Video)**

  Learn about the PDCA Cycle and how it can make your improvement efforts more effective. Plus, download a FREE 11-Page PDF on the Plan-Do-Check-Act Cycle.

  Learn More About This Term...

- **PDSA / Plan-Do-Study-Act (or Adjust)**

  PDSA stands for Plan-Do-Study-Act, or less commonly, Plan-Do-Study-Adjust.

  Learn More About This Term...

- **Peer Pressure**

  Just like any social group, there is pressure among coworkers to conform to the accepted group dynamic. This has a centering effect on a team. Groups have a tendency to pull individuals from extremes toward the center of a group.

  Under performing individuals are pressured to pull their own weight, which is a good thing. Over performing individuals, especially those who do it through hard work, may feel pressured to slow down, which adds drag to an organization's progress.

  Learn More About This Term...

- **Perfection**

  The concept of perfection provides one of the great philosophical quandaries of **Lean**. Like most **continuous improvement** disciplines, Lean promotes the relentless pursuit of **waste** reduction. It also pushes the concept of **zero defects**.

  The problem though, is that perfection is unattainable. No matter how good an operation becomes…

  Learn More About This Term...

- **Pilot Project**

  Major changes are often hard to implement all at once. It may be because the technology or idea is not fully proven, or it may be a lack of resources in getting the bugs worked out. There may also be substantial risk if there is a mistake in the planning that shuts down a large operation.

  To combat the potential for **problems**, a pilot can be used. It is a small scale, working implementation of a project.

  Learn More About This Term...

- **Point-of-Use Inventory**

  'Point of use' is simply the practice of storing any **inventory** you have at the point where it will be used.

  This is in contrast to inventory that is stored in a warehouse, or at some other secondary location. In those cases, it can be difficult to see if there is a mismatch in the usage and the amount stored on hand. Despite the best efforts of the material management team, there can be lapses. Often, the best person to tell if there is too much inventory on hand is the person who is using it on a daily basis. If she is trained what to watch for—for example, a lot of parts still left in one bin when the other bin returns—then the operator becomes an additional resources in the war on excess inventory.

  Learn More About This Term...

- **Poka Yoke (+ 8-Page Lean PDF, +Video)**

  The best way to eliminate defects is to prevent errors in processes. A *poka yoke* is a mistake-proofing device that ensures that it is impossible to make a mistake in a process. Visit this Lean term page to learn more and download a FREE 8-Page PDF about using *poka yoke* in your in Lean operations.

  Learn More About This Term...

- **Policy Deployment (+ 6-Page Lean PDF +Video)**

  Policy Deployment is the (usually) annual process of reviewing the strategic goals of an organization and aligning the company's resources towards meeting those goals. Hoshin Kanri is the Japanese term that means roughly the same. Watch a short video, and download a FREE 6-Page PDF on Policy Deployment.

  Learn More About This Term...

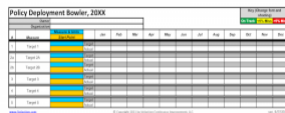- ### **Policy Deployment Action Plan**

  The Policy Deployment Action Plan provides a way to track progress on improvement priorities.

  Format: XLSX   **Regular Price:** Free for Registered Users

  [Learn More About This Term...](#)
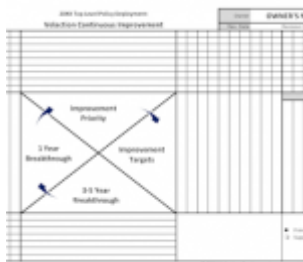
- ### **Policy Deployment Bowler**

  The Policy Deployment Bowler provides a visual way to chart an organization's progress on hitting its PD targets.

  Format: XLSX   **Regular Price:** Free for Registered Users

  [Learn More About This Term...](#)

- ### **Policy Deployment Matrix / X-Matrix (+Form +Video)**

  The Policy Deployment Matrix provides a link between strategy and frontline actions.

  Format: XLSX   **Regular Price:** Free for Registered Users

  [Learn More About This Term...](#)

- ### **Practical Exercises**

  A practical exercise is a hands-on teaching tool by which students are asked to apply the lessons they have just learned in a controlled environment. In the Crawl-Walk-Run model of learning, practical exercised fall into the 'crawl' phase.

  [Learn More About This Term...](#)

- **Practice**

  Practice is repeating a task in order to improve your skills. This doesn't mean that it has to just be an exercise. You can practice doing good **Pareto charts** by finding opportunities to use them in real situations.

  Practice is characterized by purpose. That means identifying a gap in a skill, and coming up with a plan on how to get better. Practice is also very specific. The closer a practice situation matches a real requirement, the more **effective** it is.

  Learn More About This Term...

- **Precision**

  Precision is the state of having little **variation**. It is often incorrectly used synonymously with **accuracy**. (Accuracy simply means centered on the target.)

  Precision is often much harder to achieve than accuracy. That is because variation can be much trickier to adjust than moving an average.

  Learn More About This Term...

- **Predictability**

  At the heart of standardization is predictability. Standardization provides a predictable pace, predictable **quality**, and a predictable **lead time**.

  This predictability allows managers to make better plans. It allows marketers to make more accurate promises. And it allows employees to have a steady, reasonable pace throughout the day.

  Learn More About This Term...

- **Priority Matrix**

  This post redirects to the 9-square tool, a specific priority matrix.

  Learn More About This Term...

- **Problem Solving (+11-Page PDF, +Video)**

  Problem solving is a critical skill for team members operating in a continuous improvement culture. Watch a short video, and download a FREE 11-Page PDF on Problem Solving.

  Learn More About This Term...

- **Problems**

  A problem is something that has a potentially adverse effect. Another way of looking at this is that a problem is the gap between what should be and reality.

  Unfortunately, not all problems are obvious. Think about water damage in a crawlspace. You can have a problem and not even know it. This is one of the big challenges with **Lean implementations**. People may not see the problem with excess inventory, or recognize that large batches are the equivalent of a backed up drain under your floorboards.

  Learn More About This Term...

- **Procedures**

  The generally accepted definition of procedure in a **Lean company** is that it is the "how" of an operation. It is closely related to **the term "process"**. A process would be the series of steps required to complete the operation, or the "what".

  Learn More About This Term...

- **Process**

  A **Lean** process is the bread and butter of **continuous improvement**. Processes are the series of linked actions (or steps, tasks, activities, operations, etc) performed to reach a specific outcome.

  Processes take **randomness** and bring it to order. Imagine what would happen if nobody followed a process when driving. No process for merging, pulling into traffic, or parking. There would be chaos. Imagine that when getting ready for work in the morning, there were no processes in your home. Clothes would have never gotten into your closet. You might not have hot water, because the bills would not have been paid. The list goes on and on.

  Learn More About This Term...

- **Process Flow Chart**

  A process flow chart is a staple of **Lean**, and other **continuous improvement**methods.

  It takes a **process** and transforms it into a visual representation of the **flow** of work. This makes it easy to highlight **waste**, and subsequently eliminate the things that don't add **value**.

  Learn More About This Term...

- **Process Improvement**

  Process improvement is the act of reviewing a specific **process** to make it better. The degree of formality can be minimal, such as an immediate decision to change a method on the fly. This might include moving a garbage can closer to a work station to eliminate a walking step of the process. Or, process improvement can be a highly structured, long-term, team-based approach, such as **Six Sigma**.

  Process improvement is only one aspect of any effective **continuous improvement** strategy. For example, **business systems like Toyota's** also include methods of management to keep the company moving forward.

  Learn More About This Term...

- **Process Map**

  A process map is a visual representation of how workflows through an operation. In practical Lean applications, it is often used synonymously with the term process **flow chart**.

  The truth though, is that "process map" is a generic term. A process flowchart is just one specific type of process map, albeit by far the most common one. Other proprietary alternatives are available. People occasionally even…

  Learn More About This Term...

- **Production Plan**

  A production plan must answer four basic questions:

  0. *1. What are we going to make?*
  1. *2. What does it take to make it?*
  2. *3. What do we have?*
  3. *4. What do we need?*

  Learn More About This Term...

- **Production, Over**

  See Overproduction.

  Learn More About This Term...

- **Productivity**

  Productivity is the ratio of output to input. The basic equation is:

  Productivity = Output / Input

  When the output is high relative to the inputs, the **process** is thought of as productive.

  Learn More About This Term...

- **Profit**

  Profit is the pile of money that is left over after all the bills are paid and the**costs** are tallied. There are many different types of profit for accounting purposes (net profit, gross profit, EBITDA).

  The ultimate goal of any company is to make a profit. It is not to serve customers. It is not to be good corporate citizens. It is not to create jobs and generate **employee job satisfaction**.

  Learn More About This Term...

- **Projects**

  A project is a set of interconnected tasks intended to achieve a specific goal. It is characterized by having a fixed end. Projects can be either individual or collaborative in nature. They are often limited by some constraint, usually cost.

  Learn More About This Term...

- **Psychology of Lean (+ 9-Page Lean PDF)**

  Psychology plays a far greater role in Lean than most people realize. Learn more and download a FREE 9-Page PDF about psychology in a Lean organization.

  Learn More About This Term...

- **Pull System**

  A pull system (or pull production) is one in which items are only made, transferred, shifted, withdrawn, etc., when there is demand from a downstream customer. This sharply contrasts from a push system in which the downstream actions have no impact on what the upstream process is producing.

  Pull systems and one-piece flow combine to form JIT production. Pull says only build with demand. Flow says use the smallest quantity possible, and shift in small lots. Together, pull systems and flow make sure that exactly the right amount of work is sent to the downstream process, exactly when it is needed.

  Learn More About This Term...

- **Push System (+ 6-Page Lean PDF)**

  To learn about Lean, one must also understand operations that are not Lean. Seeing the problems that push systems cause help enlighten teams to the benefits of pull. Visit this Lean term page to learn more and download a FREE 6-Page PDF about push systems in Lean operations.

  Learn More About This Term...

- **QCD / Quality, Cost, Delivery (+ 5-Page Lean PDF)**

  Metrics are vital to Lean operations. Many organizations use QDC (Quality, Delivery, Cost) to categorize their goals. Visit this Lean term page to learn more and download a FREE 6-Page PDF about using QDC to organize metrics in Lean operations.

  Learn More About This Term...

"Q" TERMS

- **Quality**

  In **Lean**, quality is often considered to be 'good parts'. That is important because quality parts are a necessary condition to create **flow**.

  Quality has several different applications.

  Learn More About This Term...

- **Queue Time**

  Queue time is a very specific form of **waiting**, one of the traditional **seven wastes**. It occurs when a person or item is in line behind something else, and is waiting for the same resource.

  Learn More About This Term...

- **Queueing Theory**

  Lines are a fact of life. They result from a company trying to keep the **costs** of providing its services in check in the face of fluctuations in **customer demand**. With enough resources to handle spikes, companies never make customers wait. Of course **profit** would drop significantly, because employees would be idle much of the time. On the other hand, if the company staffs for the average demand, they won't have enough resources to cover the busy periods. During those times, **customers** end up waiting in long lines.

  Learn More About This Term...

"R" TERMS

- ## Random

  Random means occurring by chance. There are formal mathematical definitions regarding probability distributions, but the basic definition is how the typical non-mathematician looks at randomness.

  But even with that simple definition, we often think of things as being random when they really are not. In truth, even something as simple as flipping a coin is*not* really random. It is governed by the laws of physics. The weight distribution of the coin, the speed of rotation, the force of the flick that launches the coin, the air density, wind, coefficient of friction on your thumb, the hardness of the surface, and a thousand other attributes actually govern where that coin will land.

  Learn More About This Term...

- ## Rapid Improvement Workshop / RIW

  "Rapid improvement workshop" is another name for *kaizen* event or *kaizen*blitz. You may also hear it called rapid improvement project, or "RIP".

  This type of project is generally a week long and includes:

    - A day of training
    - A day of process walk / initial planning
    - Two days of…

  Learn More About This Term...

- ## Reaction Plan

  A reaction plan is the series of steps that you would take in response to a specified **abnormal condition**.

  A reaction plan helps to minimize damage. It reduces the time between the occurrence of a problem and a stopgap.

  Learn More About This Term...

- **Red Tag**

The red tag system is simply a **communication** tool used to identify items that a person has flagged for removal from a work area. While the tagging is most frequently done during *kaizen* events, it can be done at any time.

Learn More About This Term...

- **Regulations**

Regulations are rules that are established by an authority. While the term is somewhat generic and can be used by any person or group in charge, this discussion will be limited to governmental agencies. In practice, most companies do not call their directives "regulations". There are more likely to call them policies or rules.

Governmental bodies at all levels have the power to enact laws. These laws, however, often lack clarity in the fine details. What they do, in many cases, is granted the authority for an administrative agency to create regulations. As an example, the FDA (Food and Drug Administration), by law, is tasked with…

Learn More About This Term...

- **Relationships**

  A strong continuous improvement culture requires extensive teamwork, and teamwork requires strong relationships.

  First of all, let's start by defining what a relationship is. And its surface, a relationship is simply the way people or organizations behave toward each other. But there is also a deeper layer to relationships. They also include how the involved parties *feel* about each other. How a person regards someone greatly impacts the way they act.

  Learn More About This Term...

- **Repeatability**

  Repeatability is the ability for the same individual or team to get identical results from a **process** time after time. Essentially, repeatability is the opposite of output variation.

  When processes are not repeatable, the problem falls into three basic categories.

  0. A variation in inputs causes poor repeatability.
  1. A poor process cause poor repeatability.
  2. The tools or measuring devices are flawed.

  Learn More About This Term...

- **Repetition**

  Repetition is the act of doing something the same way over and over again. Repetition helps provide stable outputs to a process by making the **inputs**consistent.

  Repetition has a side effect of creating muscle memory—the state where your body acts without conscious thought, much like walking. You don't have to think about moving your legs. Repetition makes the motion natural. This muscle memory, in **Lean** settings, helps people follow **processes** consistently.

  Learn More About This Term...

- **Resources**

  There is a common misconception that Lean is free. The truth is the making improvements requires a variety of resources. That's not to say you have to spend a lot of money to make changes, but every project does require an investment.

  Learn More About This Term...

- ### **Respect for People (+ 8-Page Lean PDF)**

  Lean requires a great deal of employee engagement to function at its best. Showing respect for people is crucial to getting that engagement. Visit this Lean term page to learn more and download a FREE 8-Page PDF about respect for people.

  Learn More About This Term...

- ### **Responsibility**

  Responsibility is the state of being accountable for something. It may be a team, a process, or an entire company. In general, responsibility is the **cost of leadership**. Being in charge means that a person has to make sure that things go as planned. Responsibility means having to answer for one's decisions .

  Learn More About This Term...

- ### **Results**

  Results are the outcomes or consequences of actions.

  In the **continuous improvement** world, results are most commonly viewed as the *intended* outcomes of an operation, organization, process, or project. This is in contrast to unintended side effects of a process.

  Learn More About This Term...

- ### **Rework**

  Rework is the act of correcting a **defect**. Rework is obviously **waste**, and can be avoided by eliminating the **root cause** of the **problem**.

  The further downstream rework is done from where the **error** originally occurred, the more the problem costs to correct.

  Learn More About This Term...

- **Right-Sized Machine**

  Production processes require assets to run them. You generally have choices. You can use a big machine that costs a lot of money, but has tremendous functionality and flexibility. These machines, because of their cost, end up being used in several processes or for several products to defray the cost. This tends to **disrupt flow**.

  The alternative is to buy or build a smaller machine that may have fewer functions. This machine is dedicated to a single process. It can then be located in a logical position to support one piece flow without causing problems for other product families.

  Learn More About This Term...

- **RIPS Cycle**

  A variation of the **Plan-Do-Check-Act cycle** (AKA the Deming Cycle), RIPS stands for Review-Implement-Prove-Standardize, and is a proven method of continuously improving **Standard Work** and other forms of process standardization.

  Learn More About This Term...

- **Risk Management**

  Risk management is the process of identifying risks, reducing them when possible, and making plans to deal with undesirable outcomes.

  Risk management can be done for an ongoing concern, such as a product line or company, or for an individual project, such as rolling out a new software package. Risk management becomes increasingly more important as the size of a project increases.

  Learn More About This Term...

- **Root Cause**

  It takes a lot of discipline to make sure you do a **root cause analysis** on problems rather than leaping to conclusions about what is going on. The**definition of a root cause analysis** is simply the act of going through a systematic process to identify the source of a problem. The most common method is the 5 Why analysis.

  Watch out for this pitfall: Many people think they know how to fix something, and will immediately start working on that **problem.** If it is not the root cause, they are just working on a **symptom**. The problem *will* return.

  Learn More About This Term...

- **Rule of Thumb**

  A rule of thumb is simply a general **process** used for a specific condition. This is different from rules, regulations, **Standard Work**, and other forms of documented instructions. In those cases, the required actions are specified. For a rule of thumb, there is no such formality.

  An example of a rule of thumb might be "measure twice, cut once." There is no real obligation to measure twice, but, over time, people have learned to follow this basic piece of wisdom.

  Learn More About This Term...

- **Rules**

  There are countless quotes about rules, most of them negative.

  Rules are made to be broken. –unknown

  There are no rules here – we're trying to accomplish something. –Thomas A. Edison

  Rules and models destroy genius and art. –William Hazlitt

  [Learn More About This Term...](#)

- **Run Chart (+Video, +9-Page PDF)**

  Run charts are a powerful problem solving tool that makes problems visual. Watch a short video, and download a FREE 9-Page PDF on Run Charts.

  [Learn More About This Term...](#)

"S" TERMS

- ## Safety

  Safety is freedom from injury and harm.

  The most obvious freedom is from immediate bodily injury. Safety switches, gate, guards, etc. help provide this, as does proper **training** and well-designed processes.

  Safety also includes freedom from chronic conditions that accumulate over time. This includes things like repetitive stress injuries, and long-term exposure to toxins.

  Learn More About This Term...

- ## Savings

  Continuous improvement focuses on **cost** reduction—the actual dollar savings that increase profit.

  The term 'savings', though, has many nuances to it.

  Learn More About This Term...

- ## Schedules

  Schedules are an important part of a continuous improvement culture. Daily schedules are used for communication and coordination as well as to highlight problems and improvement activity.

  For example, many teams start the day with scheduled time to get the work area checked out and ready to go. They also likely schedule a standup meeting at the start of the day to resolve any issues that are uncovered and to communicate daily goals. Time to organize and clean the work area (5S) is often allocated at the end of the work day.

  Learn More About This Term...

- ## Scientific Method

  The scientific method is one of many **problem solving** techniques.

  There are 5 basic steps to the scientific method.

  Learn More About This Term...

- **Scope**

  The scope is the boundary of something in business. It may apply to an agreement, contract, set of responsibility, or project. The scope defines what is covered and what is not.

  In **Lean**, the scope is most commonly used to refer to the boundary of what a project will cover.

  Learn More About This Term...

- **Seasonality**

  Seasonality is the regular pattern of peaks and valleys related to the time of year.

  Seasonality may be due to weather. Umbrellas, for example, sell best in rainy seasons; skis sell best in the winter. Seasonality may also be due to recurring annual events and holidays. Christmas means toy sales spike; August means back-to-school sales.

  Learn More About This Term...

- **Sensei**

  In Lean, the term s*ensei* means 'expert' or 'master' and highlights the Japanese origin of modern lean practices. Its use shows great respect to the recipient. It is normally bestowed upon lean practitioners who have shown extraordinary skill in lean implementation, and are exceptional at passing that knowledge on to others.

  Learn More About This Term...

- **Sensors**

  Sensors are mechanical devices that are sensitive to their environment, and that communicate information about what they detect.

  Sensors can detect pressure, temperature, speed, and a host of other things. Sensors are commonly linked to either an alarm of some sort (a buzzer when a seat belt is not fastened), or a *poka yoke* device (key won't turn if the sensor notices that the car is not in park).

  Learn More About This Term...

- **Setup Reduction**

  Setup reduction is the act of lowering the time it takes to switch from one product to another.

  In a traditional manufacturer, the switching time (changeover) is long. As a result, if they do more than an occasional switch, they run out of production time. So, they produce long runs of parts, adding to inventory and all the problems that brings: more space for storage, more quality problems, more money tied up in inventory, more inventory management, longer lead times, etc.

  Learn More About This Term…

- **Setup Time**

  Setup time is the time it takes to reconfigure a machine to run a different part. Setup consists of two basic categories.

  0. **Internal setup time.** This type of setup time requires that a machine be shut down to do the tasks required to get ready for a different product. This is extremely **wasteful** as **production** comes to a grinding halt…

  Learn More About This Term…

- **Seven Wastes**

  See also Waste.

  Learn More About This Term…

- **Sheet, Standard Work Combination**

  See Standard Work Combination Sheet.

  Learn More About This Term…

- **Shojinka**

  Shojinka is a form of flexible manufacturing, where the number of workers vary to match demand requirements. This is obviously superior to a static system that staffs work areas without consideration to fluctuations in production requirements. Being able to reassign people to exactly where they are needed will help keep production areas of falling behind. This form of flexible staffing also releases people to work on improvement projects when demand is low across the board.

  Learn More About This Term...

- **Shop Floor**

  'Shop floor' is a generic term used to describe the work areas where production is done. The terminology is important because there has been a migration of Lean from the shop floor to office, healthcare, and other service environments. Because there are differences in the way some tools are applied in different types of work areas, it makes sense to have a way to clarify what you are talking about.

  Learn More About This Term...

- **Side Effects of Lean**

  While Lean and other continuous improvement efforts can make impressive changes in an organization, there are often some unintended side effects.

  These Lean side effects include:

  o **Possible accounting issues.** The dramatic changes in inventory and the way costs are applied can be disruptive to financial documents. In some cases it can even appear that something negative is happening.

  Learn More About This Term...

- **Simplicity**

  Simplicity is, simply put, the lack of **complexity**.

  In the modern world, complexity is looked upon as a sign of advancement and prowess. Simplicity is viewed as the earmark of an amateur.

  Learn More About This Term...

- ### Single Minute Exchange of Die

  One of the core principles of Lean is to create **flow**. It is impossible to achieve with long setup times.

  When it takes an extensive amount of time to switch from one product to another, operators must run large lots to produce enough parts to keep production flowing.

  Learn More About This Term...

- ### SIPOC Analysis Sheet

  The SIPOC Analysis Sheet is a tool to help understand the flow of value from supplier to the customer. SIPOC is the acronym for Supplier-Inputs-Process-Outputs-Customer.

  Format:XLSX

  Regular Price: Free for Registered Users

  Learn More About This Term...

- ### Six Sigma

  Six Sigma® is one of two most common **continuous improvement** methods.**Lean** is the other one.

  The term Six Sigma comes from the Greek letter 'σ' that is used as the symbol for standard deviation. Six Sigma refers to how many standard deviations fall within the output of a **process**.

  Learn More About This Term...

- ### Skew

  Skew, in layman's terms, means that data is distorted. The **data** points don't fall evenly around the center of a distribution.

  Consider this example. Assume ten people are in a room, and you want to know what their average net worth is. If this was a typical cross section of America, the number would be $53,100

  Learn More About This Term...

- **Skills**

  The simple definition of a skill is the ability to do something well or having a particular expertise in an activity.

  In typical organizations, the set of skills required by individuals tends to be fairly narrow for frontline employees and leaders. For the most part, they are asked to do their job and not much else.

  [Learn More About This Term...](#)

- **SMART Goals**

  "SMART" is a commonly used mnemonic device that helps you set effective goals.

  SMART stands for…

  - *Specific*
  - *Measurable*
  - *Attainable*
  - *Relevant*
  - *Timely*

  [Learn More About This Term...](#)

- **SMED**

  SMED means 'single minute exchange of dies'. It is one of the great enablers of **Lean manufacturing** for the simple reason that it reduces **batch** sizes.

  Simply put, when **changeover** takes a long time, a machine that makes many parts needs to run big batches all at once to be able to provide enough product to the **downstream** processes. This drives up **inventory** and reduces flexibility of the **production** system.

  [Learn More About This Term...](#)

- **Soft Savings**

  Soft savings are the intangible **benefits of continuous improvement**. Contrast this with **hard savings** which are those that can be pointed to as a line item on some sort of financial record such as a receipt or an invoice.

  Soft savings tend to fall into two basic categories…

  Learn More About This Term...

- **Solutions**

  Solutions in a Lean environment tend to be temporary. The rationale behind the statement lies in the term continuous improvement. Any new process you develop, by definition, will eventually change. "Solution" implies that a problem is solved once and for all. The two terms don't play nice together.

  Learn More About This Term...

- **SOP / Standard Operating Procedure**

  SOPs are set instructions that describe how to behave in a particular situation. SOP stands for standard operating procedure, or, alternatively, standing operating procedure though the latter term is falling out of use. Both are generally used interchangeably.

  An SOP is generally written. Informal SOPs exist, but are more often than not ineffective. Standard operating procedures are commonly used to define business **processes**, but can be used for virtually anything requiring instructions.

  Learn More About This Term...

- **Spaghetti Charts**

  A spaghetti chart is a visual depiction of the **flow** of a person through their workstation. The spaghetti chart may also be used to depict the flow of information and materials as well.

  Typically, the chart is done on a **Standard Work Sheet**, mostly out of convenience. The sheet may already be available with the work area's layout drawn in, and it has a grid on it to make drawing the spaghetti chart easier.

  Learn More About This Term...

- **Speaking in Negatives**

  When someone is happy, they say 'I am happy." They do not say, "I am not sad." When people speak in negatives, they are typically meaning, at least subconsciously, whatever they are saying with the 'not' removed. In the case above, if a person says "I am not sad", it really translates to "I am sad."

  People use this speech mechanism frequently. Listen for it, and you will hear countless cases of it. Normally, the speech pattern is used when there is a need to prevent true feelings from coming out, such as when there is a big change at work that a person is uncomfortable with. When feelings are clear, there is no wordsmithing. I have never once seen a truly excited person respond by speaking in negatives. No lottery winner ever exclaims, "I'm not disappointed." People don't get off roller coasters and describe it as "not slow and boring."

  [Learn More About This Term...](#)

- **Special Cause Variation**

  Special cause variation is one of the two main categories of variation. **Common cause**, the other type, is the consistent, recurring fluctuation within a system.

  Special cause variation, in layman's terms, are the spikes that are cause by problems outside of those that regularly affect a **process**.

  [Learn More About This Term...](#)

- **Specifications**

  Specifications are the stated design parameters of a product or service. Specifications can cover any of a variety of features, from physical dimensions, to operating range, to battery life.

  Some specifications are given with a margin of error, such as '12.00 +/- 0.10 inches'. Other specs are given with a maximum or minimum, such as <250 ppm of a contaminant.

  [Learn More About This Term...](#)

- **Stability**

  The term stability is the tendency of something to keep its current state. The opposite of stability is Lean operations is **variation**, or the state of things fluctuating wildly, or drifting away from normal.

  Stable **processes** tend to not only produce high **quality** outputs, but also do it in a **predictable time** with a minimal amount of **waste**.

  Learn More About This Term...

- **Staffing**

  Staffing in a Lean organization is a bit different than it would be in most other companies. First of all, in general, a Lean organization will need fewer people to do the same amount of work that is done in a non-Lean company. But there is more to it than just that. You cannot just harvest all of the gains that you make with your improvements. There are some additional requirements that come from focusing on improvement.

  Learn More About This Term...

- **Stakeholders**

  Stakeholders are the people that are vested in the outcome of something. They are not necessarily people who actually do the **process**, but they do have some skin in the game.

  Stakeholders that are indirectly affected by a process frequently have a negative effect from the change. In many cases, they will be asked to bear some of the **costs** of a new method despite getting none, or very little, of the benefit.

  Learn More About This Term...

- **Stand-Up Meeting**

  Stand up meetings are the quick team gatherings to make sure that the day is properly planned out. Topics generally include the current day's **goals** and issues, previous day's results, ongoing project status, and anything special on the agenda.

  Learn More About This Term...

- **Standard Work (+14-Pg Lean PDF +MP3 +Forms +Video)**

Standard Work is at the core of most Lean operations. It adds consistency and efficiency to a process. Watch a short video, and download a FREE 14-Page PDF on Standard Work.

Learn More About This Term...

- **Standard Work Combination Sheet / SWCS (+Form +Video)**

The Standard Work Combination Sheet provides a visual representation of the flow of work and the interactions between person and machine.
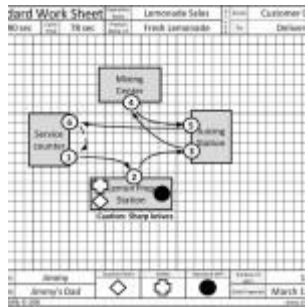
Learn More About This Term...

- **Standard Work Combination Table**

See also Standard Work Combination Sheet.

Learn More About This Term...

- ## **Standard Work Sheet (+Form +Video)**

The Standard Work Sheet shows an overhead view of the layout of a work area and shows the flow operators and materials within it.

Learn More About This Term...

- ## **Standard Work-in-Process (+ 7-Page Lean PDF, + Video)**

Standard Work-in-Process controls the amount of inventory in a system and allows Standard Work to flow smoothly. Visit this Lean term page to learn more and download a FREE 7-Page PDF about Standard Work-in-Process.

Learn More About This Term...

- ## **Standardization (+ 9-Page PDF)**

Standardization is at the heart of nearly all the Lean tools. Learn more and download a FREE 9-Page PDF on Standardization.

Learn More About This Term...

- **Standardized Work Sheets**

  Standardized Work Sheets are another name for **Standard Work Sheets**, the more common of the names, as well as the entry under which we post our free form. They are one of the basic forms used for documenting **Standard Work** in **Lean**.

  Standardized Work Sheets show header information, defining the **process**, and they show the layout of the area on graph paper.

  [Learn More About This Term...](#)

- **Standards (+ 6-Page Lean PDF)**

   Standard define the expectation. Strong Lean leaders set clear standards and track deviation from them so they can fix the underlying processes. Visit this Lean term page to learn more and download a FREE 6-Page PDF about standards in Lean operations.

  [Learn More About This Term...](#)

- **Status Quo**

  The status quo is defined as the current or existing state or condition. In plain English, it is how things are today.

  There is an old adage that the definition of insanity is doing things the same way and expecting different results. Getting better requires that something is done differently. If a **process** never changes, the output of that process will not change either.

  [Learn More About This Term...](#)

- **Stopgaps (+ 5-Page Lean PDF)**

A stopgap is a short-term fix to prevent a known problem temporarily until a better, permanent solution can be devised. Visit this Lean term page to learn more and download a FREE 5-Page PDF about using stopgaps in Lean operations.

Learn More About This Term...

- **Stopwatch**

Everyone, of course, knows what a stopwatch is.

They may not, though, understand why someone is standing over them with one. In a Lean company, processes are based on facts and data. One of those facts is the time it takes to accomplish a task.

Learn More About This Term...

- **Sunk Costs**

A sunk cost is an expense that has already been incurred and has no bearing on future decisions.

Imagine that you are working on restoring an old car and have budgeted $2000 to complete the project. After all the repairs are made and you turn the key, you hear nothing. You learn that it will **cost** another $1000 to get it operational. Conventional wisdom says that the decision to proceed or not is based on the total amount spent, or the $3000. Even the old adage "Don't throw good money after bad" reinforces this train of thought.

Learn More About This Term...

- **Supervision**

  Supervision is the act of providing oversight to people or processes. The amount of direct supervision required is generally inversely proportionate to the structure of the operation. With that means is simply this: **if you have strong processes**, people have less of a need for supervisors telling them what to do next.

  Learn More About This Term...

- **Surveys**

  There are many ways to learn about your customers, vendors, or employees. You can watch how they behave. You can do research or purchase data about them. You can analyze the data you already have. Each of these, though, is somewhat passive, and thus limits the information you can gather. You are only able to watch the behaviors that individuals choose to show.

  The alternative is to go out and ask specific questions. This may be in the form of a forum or a focus group, but the most common way to pull information from people is with a survey.

  Learn More About This Term...

- **SWAG**

  SWAG is an acronym, likely originating in the US Army, for scientific wild ass guess. It is used to describe a hypothesis or **decision** that is based on a small amount of factual **evidence**, but nowhere near enough to have certainty.

  Learn More About This Term...

- **SWOT Analysis**

  SWOT analysis stands for strengths, weaknesses, opportunities, and threats. It is a structured approach for **assessing at a project**, new business venture, ongoing concern, or similar situation.

  By itself, SWOT analysis has limited utility. It has much more value when used with a purpose, such as a product launch, an **annual strategy session**, of when deciding whether to venture into a new industry

  Learn More About This Term...

- **Symptoms**

  In the medical world, a symptom is just the visible evidence of a disease or injury. For example, swollen painful joints may be a symptom of arthritis, or nausea might be a symptom of food poisoning.

  In continuous improvement, symptoms are similar. They are the 'tells' that let you know that there is something that is just not right with a process or product. They are often the only way to identify an underlying problem-the root cause of an issue. A specific type of symptom is the abnormal condition-an indicator that something is disrupting the smooth operation of a process.

  Learn More About This Term...

"T" TERMS

- **Taiichi Ohno**

  Taiichi Ohno (February 29, 1912-May 28,1990) is considered by many to be the father of the **Toyota Production System**. He eventually rose to the rank of executive vice president in the company.

  While Ohno had many innovative ideas and published several landmark books (**see them and other books about him here**), perhaps his biggest creative leap was integrating the American supermarket system of resupply into the automotive industry. He was able to lay the foundation for **kanban** systems, pull, and one-piece flow by changing the way components were supplied to production processes.

  Learn More About This Term...

- **Takt Time (+13-Page Lean PDF +Video +Tool)**

  Takt time is the required pace of production. Managing with it adds a great deal of stability to an organziation. Watch a few short videos, and download a FREE 13-Page PDF about takt time.

  Learn More About This Term...

- **Takt Time Calculator**

  This Lean tool helps you quickly calculate your *takt* time.

- Learn More About This Term...

- **Target Condition**

  When most people think of goal setting, **KPIs**, or improvement metrics in general, they tend to focus on targets. A **lead time** of 2 days is a target. 97% on time delivery is a target. **Productivity** of 7.6 units per labor hour is a target.

  Learn More About This Term...

- **Team**

  In its purest form, the definition of a team is "a group of people associated with each other for some form of joint action or activity." The word choice for this definition is very deliberate. Some definitions add in verbiage that implies effectiveness. Examples include 'common goal', 'working together', 'organized', 'focused', etc. That terminology is misleading, as not all teams agree on common goals, and there may be teams that are unfocused.

  Learn More About This Term...

- **Theory of Constraints**

  The "Theory of Constraints" is the management philosophy of Eliyahu M. Goldratt. He introduced it in his 1984 book, **The Goal**.

  The overall premise is that a system can only produce as fast as the slowest step. The throughput of the system, therefore, can be improved with a focused effort to improve that step, the **constraint**.

  Learn More About This Term...

- **Therbligs**

  In the early 1900's, Frank and Lillian Gilbreth refined a system of analyzing work to improve processes. They focused on identifying the core 'motion cycles' that combined to form work activities.

  This detailed understanding of work let them identify inefficiencies and eliminate waste.

  The name 'Therblig' comes from a reversal of the letters of their name, using the 'th' as a single letter.

  Learn More About This Term...

- ## Time Management

Time management is the act of consciously planning out how one spends the hours and minutes of a day. For structured, repetitive production work, most people tend to be fairly good at managing their time. When the demand is not so consistent, though, people tend to squander a lot more of this precious resource.

Time management has two basic aspects to it. The first is that you have to be selective in *what* you do. The second lies in being efficient and more importantly, effective in *how* you do things.

Learn More About This Term…

- ## Time Observation Sheet (+Form +Video)

The Time Observation Sheet is used to establish cycle times for Standard Work.

Learn More About This Term…

- ## TIMWOOD

TIMWOOD is a mnemonic device used to help people remember the different forms of **waste** associated with **Lean.** These seven wastes are widely accredited to **Taiichi Ohno**.

The TIMWOOD Acronym

- o **Transportation:** Moving materials from one place to another is a **waste of transportation**…

Learn More About This Term…

- **Tooling**

  Tooling is a generic term for any of the variety of equipment associated with production machines, especially **ones that do fabrication**. Cutting tools, dies, precision clamps, injection molds, **jigs, and fixtures** all fall into this category.

  Learn More About This Term...

- **Tools, Lean**

  See Lean Tools.

  Learn More About This Term...

- **Total Productive Maintenance**

  Total Productive Maintenance keeps machines operational in a way that supports production processes. Total Productive Maintenance combines routine scheduled preventative maintenance with predictive maintenance to limit the impact machine downtime has on operations.

  Learn More About This Term...

- **Toyota® Production System**

  The Toyota® Production System began in earnest in post World War II Japan as a way of managing operations in a challenging economic time.

  The Toyota Production System really began as a synthesis of **Henry Ford's**operations and those of the U.S. supermarket system.

  Learn More About This Term...

- **TPM**

  See **Total Productive Maintenance**.

  Learn More About This Term...

- **TPS**

  TPS is the acronym for the Toyota Production System. TPS is more of a business philosophy than a production system, though. It focuses on manufacturing and logistics, but doesn't neglect the human aspect of production.

  TPS was founded in large part by **Taiichi Ohno**. TPS can trace its origins back to the early days of **Ford** and American supermarkets. Mr. Ohno was impressed with the way supermarkets ordered their **inventory**. He combined it with the positive things he saw from Ford to form the foundation of TPS.

  Learn More About This Term...

- **Training (+ 7-Page Lean PDF)**

  Download a 7-page Lean PDF file on different styles of continuous improvement training. Part of our Continuous Improvement Companion.

  Learn More About This Term...

- **Training Plan**

  Training does not happen by accident. Building an effective team requires planning. This training plan should, at the minimum, consider the following:

  - The overall needs of the organization
  - An assessment of the current skills of the team
  - Training capabilities
  - Training goals

  Learn More About This Term...

- **Transportation Waste**

  See Waste of Transportation.

  Learn More About This Term...

- **Tribal Knowledge**

  Tribal knowledge is the unwritten collective wisdom of an organization. It refers to the tradition of tribes handing information down from generation to generation in the time before the written word was developed.

  In the same fashion, when information is not document properly, it must be passed from employee to employee.

  Learn More About This Term...

- **Trust**

  Trust is an important part of **continuous improvement**. Team members have to believe their bosses. They have to be sure that making gains won't cost them their jobs and that making mistakes on projects won't get them in trouble.

  Lean requires a great deal of autonomy from frontline employees. **Lean leaders**need to trust them to **make decisions** on their own and to act in line with the needs of the company.

  Employees also have to trust each other. They need to know that if they help other people when their workload is low that they will be helped out when they see **a spike in demand**.

  Trust comes in two basic flavors. The first is honesty. It simply means that a person can be taken at his or her word. And to be clear, lying by omission is still lying. And being intentionally deceitful, even if the message is technically true, is also still lying.

  The second form of trust relates to behaviors. It is confidence that a person will act in a predictable, appropriate manner. That means that he follows through on what he says he will do, and that he lives up to expectations. It means that employees will be where they are supposed to be and will do what they're supposed to do, even when managers are not around. And it means that managers will protect their employees and look out for their well-being.

  Learn More About This Term...

- **Two-Bin System (Kanban)**

   A two-bin system is a ***kanban*** method used to simplify replenishment on a production line.

   The process is simple. An operator pulls from one bin until it is empty, and then, depending on how the ***kanban card*** is attached, either turns in the *kanban* card (if fastened by hook and pile), or turns in the whole bin (if the card is permanently fixed).
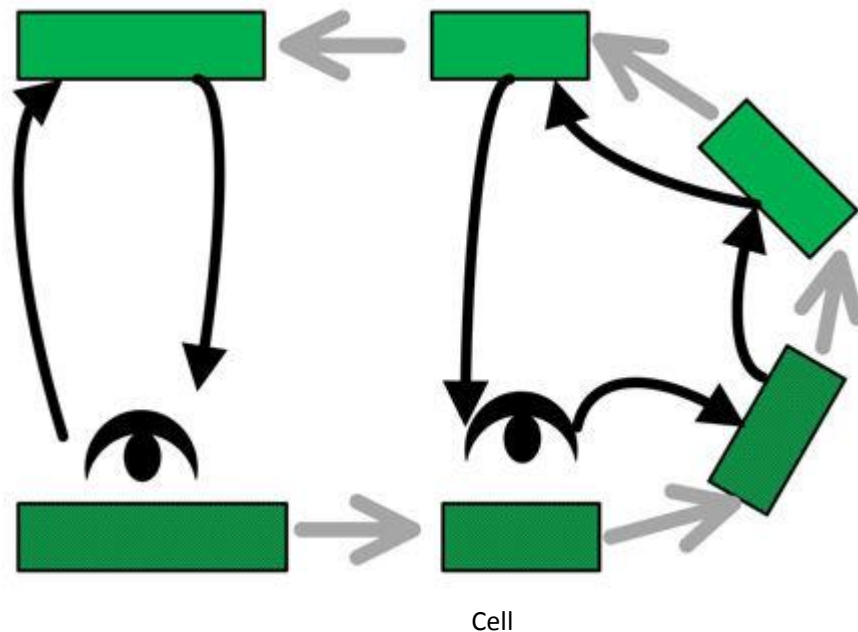
   Learn More About This Term...

"U" TERMS

- **U-Shaped Cell**

  A U-shaped cell is exactly what it sounds like—a work area that is organized in the shape of a 'U'. The U-shaped cell allows an **operator** to finish her work in virtually the same location that she started, eliminating the **waste** of **walking** back from the end of a **line** to the start.

  Cell   U-Shaped

  Learn More About This Term...

- **Upstream Processes**

  Lean often uses the analogy of running water.

  Making products move quickly and effortlessly is described as **flow**. Flow is often likened to straightening out a meandering river into a smooth, straight channel.

  Learn More About This Term...

"V" TERMS

- ## Vacations

  Vacations and holidays are an important part of **job satisfaction** and employee retention. They provide employees an opportunity to recharge the batteries and to live their lives outside of work. Managing vacations can be difficult in any company, but the challenge can be amplified in a Lean organization where there is very little excess capacity and very structured work. With a good strategy, though, the impact can be reduced substantially.

  Learn More About This Term…

- ## Value

  Value, simply put, is something that a **customer** is willing to trade for. The trade is most commonly done with cash, meaning that a customer is willing to pay for it. Not all things that are valued are paid for, though. Consider the numerous free downloads on this site. Customers who value the information don't pay, but rather register on the site or subscribe. They trade permission to contact them for the value they find in the content. Facebook customers trade the easy access to friends' information they value for permission to data-mine and advertise.

  Learn More About This Term…

- ## Value Stream

  A value stream is the series of activities that take a product from the supplier to the **customer** (for a physical product), or from the customer request to filling that need (for a service or informational product). It includes all the value-adding processes that the company performs in the **Lean office** or on the shop floor.

  The value stream takes a big picture view of what a company does to deliver goods or services to the customer.

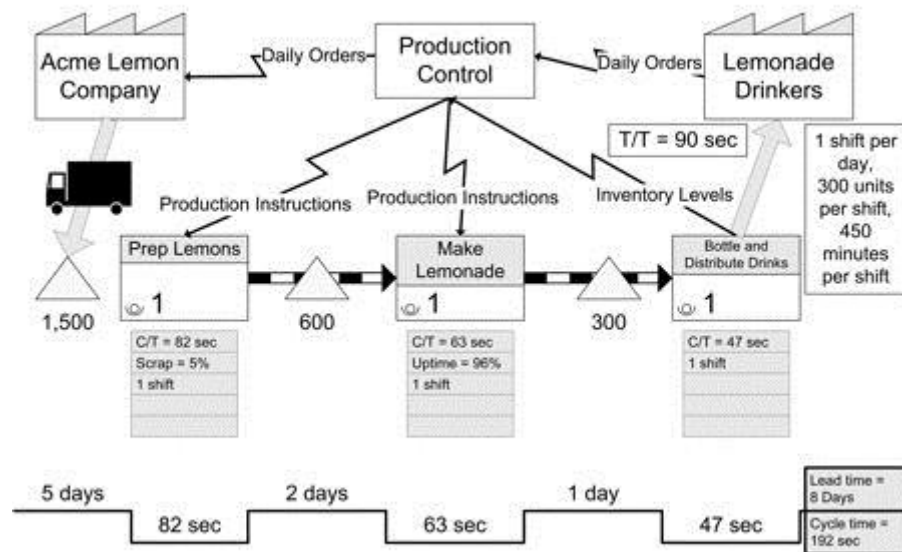 Learn More About This Term…

- **Value Stream Analysis**

   Value stream analysis is one of the steps in the **value stream mapping process**. The first step is to create a current state value stream map. This is simply a snapshot in time of the current conditions of an organization. Once the map is complete, however, you must decide what to do.

   Learn More About This Term...

- **Value Stream Map**

   A value stream map (VSM) is a drawing that depicts the **flow** of material and information along a **value stream** (the linked series of **processes** that brings a product from raw materials into the hands of the **customer**, or that provide a service to a customer).

Jimmy's Lemonade, Current State Value Stream Map

   Learn More About This Term...

- **Value-Added Work**

   Value added work consists of the tasks that a **customer** is willing to pay for. Generally this is something that changes the **form, fit, or function** of raw materials.

   Learn More About This Term...

- **Variation**

  Variation is the enemy of **processes**. Variation in the **inputs** or in the process itself causes variation in the output of the process. And that variation is perceived as poor **quality**.

  The layman's definition of variation is simply fluctuation.

  Learn More About This Term...

- **Visual Control**

  A visual control builds on **5S**. It uses organization and standardization (usually in the form of **Standard Work**) to make an **abnormal condition** stand out.

  In a **Lean** environment it does three things:

  0. *A visual control shows the current condition quickly.*
  1. *A visual control shows what the standard is quickly.*
  2. *A visual control links to an action.*

  Learn More About This Term...

- **Visual Management**

  Visual management is the concept of making a workplace more **effective** by making the current condition of a workplace obvious at a glance.

  But visual management doesn't stop there. For it to be effective, there must also be a predetermined course of action when a specific (whether normal or abnormal) condition is identified.

  Learn More About This Term...

- **Voice of the Customer / VOC (+ 15-Page Lean PDF)**

 Most companies say that the customer is important, but hardly listen to them at all. Great companies focus on capturing the Voice of the Customer (VOC) from numerous sources. Visit this Lean term page to learn more and download a FREE 15-Page PDF about how the voice of the customer should affect your Lean operation.

Learn More About This Term...

- **Volunteers**

Volunteering plays a **big role in continuous improvement**. In many organizations, training is provided, but may not be mandatory. Prospective students may have to sign for a "Corporate University" rather than be directed to attend by their supervisor. Projects are also often filled first with willing participants. Efforts to improve one's job may be **appreciated by leaders**, but might not be required.

Learn More About This Term...

- **VSM**

See Value Stream Map.

Learn More About This Term...

"W" TERMS

- ## Wait Time

  Waiting is one of the **seven wastes** first introduced by **Taiichi Ohno**, and still commonly used in modern **Lean**.

  Wait time is particularly bad because it consumes a non-renewable resource, and an important one at that: Time.

  Learn More About This Term...

- ## Walk Time

  Walk time is an important factor in continuous improvement. Its **main impact is on the seven wastes** and on Standard Work. Obviously, the problem is that walking takes time that could be better spent working on a process. Walking distance adds up in a surprising hurry.

  Learn More About This Term...

- ## Warehouses

  Warehouses are organized storage locations. They can store both finished goods or raw materials and components. While some warehousing can be unavoidable, in general, these types of storage facilities go against most Lean principles.

  Learn More About This Term...

- ## Waste (+ 9-Page Lean PDF +Video +MP3 +Form)

  The "seven wastes" is one of the most important continuous improvement terms you will hear. Most of the Lean tools, at their core, focus on reducing waste to improve flow. The seven wastes provide a systematic way to categorize problems and identify improvement priorities.

  Learn More About This Term...

- **Waste of Transportation**

  Transportation waste is the unnecessary movement of parts, double-handling of materials, or shuffling of inventory to get access to the right components. Transportation waste is one of the **seven wastes** that **Taiichi Ohno** identified as barriers to **flow**.

  Learn More About This Term...

- **Waste Recording Form (+Video +Form)**

  The Waste Recording Form is used to identify and eliminate waste from a work area.

  Format:XLSX   **Regular Price:** Free for Registered Users

  Learn More About This Term...

- **Waste, Overproduction**

  See Overproduction.

  Learn More About This Term...

- **Water Spider / Water Strider / Mizusumashi**

  A water spider or '*mizusumashi*' in Japanese (see our listing of **Japanese Lean terms**), is a person who has a prescribed set of tasks to keep materials in stock at the **point of use** in production areas. (Note that the water spider is alternately called a water strider.)

  This differs from a material handler in that the sequence of operations and the way the tasks are performed are specified.

  Learn More About This Term...

- **Whys, 5**

  See 5 Whys.

  Learn More About This Term...

- **WIFM?**

"WIFM" is an acronym for "What's in it for me?" (Note that it is only approximate because the number of "I"s does not match.)

People tend to be rather logical, cause-and-effect types of creatures. They act when there is a reason to act. The basic premise of this acronym is that when that result of an action is in the best interest of a person, they are more likely to choose to do it.
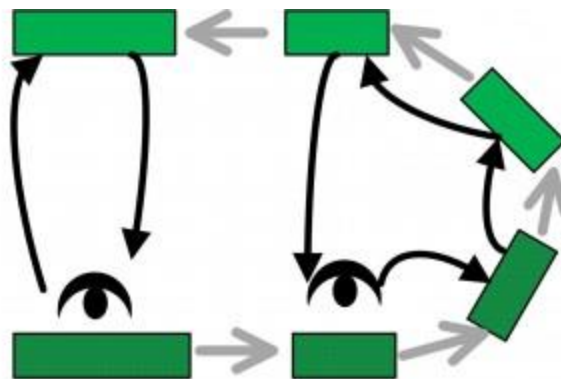
Learn More About This Term...

- **WIP**

  See Work-in-Process.

  Learn More About This Term...

- **Work Cell**

  A work cell is an area in a **Lean** company organized around the production of a specific product or product group.

  A work cell should be designed to promote **flow** and reduce **waste**.

U-Shaped Cell

Learn More About This Term...

- **Work Instructions**

  Work instructions are the specific details on how to do a job. They go hand-in-hand with **Standard Work**. Standard Work lays out the big picture sequence of the work; work instructions spell out the step-by-step methods used to do a job.

  Work instructions are characterized by:

  - Pictures of how work should be done
  - Specifications, such as torque
  - Part numbers and quantities of components
  - Tools required to do the work
  - Special safety instructions

  Learn More About This Term...

- **Work Sequence**

  The work sequence is, not surprisingly, the order in which tasks are completed. Work sequence is also commonly referred to as the sequence of operations.

  Learn More About This Term...

- **Work Units**

  One of the basic goals of lean is to create flow. The rationale is that the more that material sits in one place, **the more waste it creates**.

  In most cases, this means a single piece of work through the connected processes. This is where the term "**one-piece flow**" comes from. In some cases, though, it is okay for more than one item to move together.

  Learn More About This Term...

- **Work-In-Process**

  Work in process (sometimes written as work-in-process and sometimes called work in progress) is a product or service that is partially completed. These goods have had something done to them, so are no longer considered raw materials or component parts.

  Lean attempts to minimize the amount of work in process to keep the total inventory in the company at a minimum.

  Learn More About This Term...

- **Work, Standard**

  See Standard Work.

  Learn More About This Term...

- **Workaround**

  A workaround is an unofficial or temporary fix for a problem. In effect, it is an admission that the issue cannot be immediately resolved, and a patchwork fix is put in place.

  Workarounds are not intended to be permanent fixes, but have a tendency to be left in place longer than anticipated. One problem with a workaround is that it is often quickly pieced together, so is generally not a robust or efficient process. Workarounds often collapse under increased pressure, such as when demand picks up, or new people come into the job.

  Learn More About This Term...

- **Workgroup**

  "Workgroup" is a generic term used to describe an organization within a company that reports to a single individual. A workgroup may be a small team reporting to lead, or a much larger group reporting to a department manager.

  Learn More About This Term...

- **Workstation Design**

  One of the key elements of any process is the workstation. Simply put, a workstation is the area that contains the work surfaces, fixtures, tools, and materials needed to perform a job.

  Classic thinking promotes the use of standard workstations. These off-the-shelf setups can be interchangeable, and often can be purchased at significant bulk discounts. The **problem with purchasing a workstation out of a catalog** is that it does not necessarily meet the needs of the operator performing the process.

  Learn More About This Term...

- **Workstations**

  Workstations are exactly what they sound like. They are the locations where work is completed. In a non-**Lean** environment, workstations tend to be assigned to individuals, lack **standardization**, and often are very general in design. For example, a company may have a standard 6 foot long workbench with a shelf above it that is used in a variety of work areas.

  Workstations in a Lean company vary significantly from those that are not focused on **flow**.

  Learn More About This Term...

"Y" TERMS

- **Yellow Belt**

  A "Yellow Belt" designates that a person has been trained to participate in a Six Sigma project. In some rare instances, you m ay also see the yellow belt used in the Lean community.

  Learn More About This Term...

- **Yield**

  Yield is a quality ratio. It is calculated by dividing the number good pieces of work by the number of pieces of work started, and is expressed as a percent. If a process starts work on 100 items, for example, and 92 make it off the end of the assembly line, the yield is 92%.

  Learn More About This Term...

- **Yokoten**

  Yokoten is a Japanese term that loosely translates into "horizontal deployment." Essentially, it is the spreading of information across the organization. A key point to this is that it is not just the result that is shared, but also the process that led to the result.

  Learn More About This Term...

"Z" TERMS

- ## Zero Defects

  Zero defects is a philosophy of Lean. It simply means that every process should be designed so that it is impossible to produce poor **quality**. The underlying premise, which is true in nearly every case, is that the **cost** of preventing**problems** is lower than the cost of fixing them.

  Learn More About This Term...