

THE IMPROVEMENT HIERARCHY

Michael V. Petrovich
Managing Partner
Forefront Alliance, LLC
Vancouver, WA 98683
mvp@mvpprograms.com
www.forefrontalliance.com

SUMMARY

Like Maslow's "Hierarchy of Needs," this paper proposes the existence of a business improvement hierarchy. The "Improvement Hierarchy" suggests that businesses must address fundamental system issues to sustain or even achieve improvement objectives. Knowledge of the Improvement Hierarchy can suggest where an organization should start on their road to improvement.

INTRODUCTION

In 1954, Abraham Maslow introduced a theory of human motivation that proposed there exists a hierarchy of human needs. The lowest of these needs are the physiological needs, such as hunger and thirst. Moving up the hierarchy, we find security needs, followed by social needs, self-esteem and finally something Maslow called "self-actualization." These needs are what Maslow believed drove human motivation. Maslow's theory was that people will be motivated to satisfy lower needs first and then move to higher level needs. This theory assumed an innate drive to eliminate deficiency needs and acquire growth needs on the part of the individual.

When we examine businesses seeking sustained improvement, a hierarchy of business needs also exists. If we place sustained or continuous improvement at the top, there must be an infrastructure supporting this achievement. The improvements we are discussing may include improvements in safety, quality, cost, delivery, efficiency, speed, environment, innovation, morale, or customer satisfaction, delight and loyalty. The question we must ask ourselves is, "What sustains these improvements, and what allows us to get there?" Maybe a more interesting question is, "What prevents us from getting there?"

Many years ago, this author was sent to a supplier to review their quality systems, and assess a critical situation. The supplier had a large quantity of quarantined products deemed to be nonconforming by the customer. The customer was interested to know if anything could be done with this product and what should be done with this supplier. Now generally, when taken on a plant tour, there is usually something that the plant personnel can show in which they take pride. That was not the case here. This particular plant was depressing. It was in a very sad state. They had high inventory, with a high level of scrap and quarantined product. The housekeeping was terrible, the equipment was beat-up, and the employee relations were not good. In discussing the situation, I made the comment, "They need a lot more than SPC."

A few years later, in the early 1990s, I developed the Improvement Hierarchy. As I reflected back on this situation with this supplier, it became obvious what this plant needed and what they needed to do to turn this around. Over the years as I visited other plants in other companies, I would keep this Improvement Hierarchy in mind. It has allowed me to better understand a number of situations.

In training classes I have given over the years, I have presented this Improvement Hierarchy. Time after time, students would tell me this was the most valuable tool they received. I believe it is because it gave them a perspective of some things they knew needed to be addressed, but could never quite put into words or a logical framework. I introduce this concept here, to spark your thinking on what must be addressed in your own plant, office, or business. We will focus in this paper on manufacturing operations, but you will see that these concepts apply to service and administrative areas as well. We will begin with a description of the Improvement Hierarchy, discuss the hierarchy elements, and then discuss the implications.

THE HIERARCHY

The proposed hierarchy may be seen in Figure 1. The lowest level is "Organization Purpose, Vision, and Design." This is followed by "Management Self-Discipline," "Management-Employee Trust and Respect," "Housekeeping,"

“Maintenance,” “Standardization,” “Control” and finally, “Improvement.” What you will notice about each of these elements is that as you go up the hierarchy there is an increase in discipline. Higher levels require increasing discipline. The lower elements create a foundation, and just as in a building, if the lower elements are not solid, the entire structure will collapse. You must start with lowest levels needing work. Upon reaching the top, lower levels are then further strengthened.

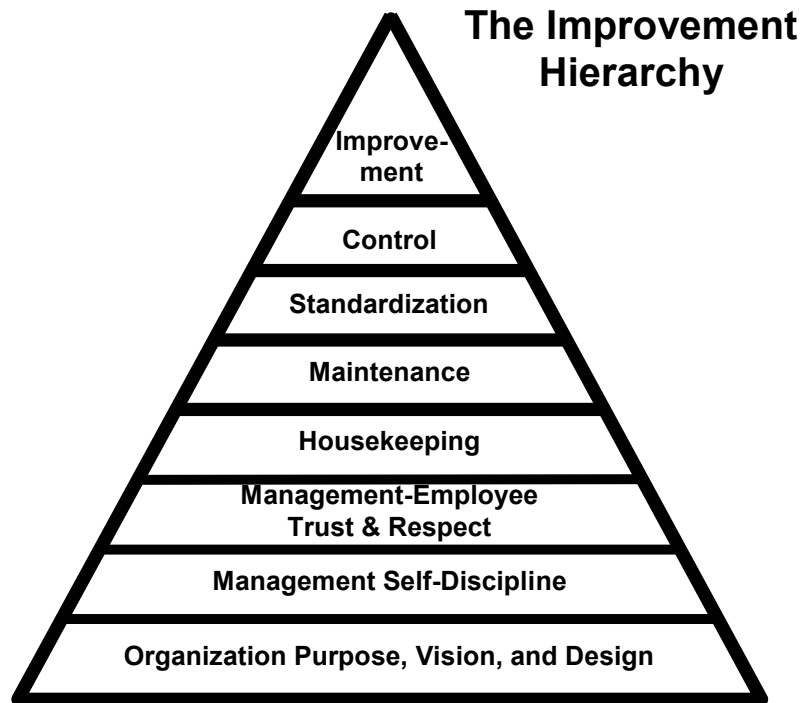


Figure 1.

ORGANIZATION PURPOSE, VISION & DESIGN

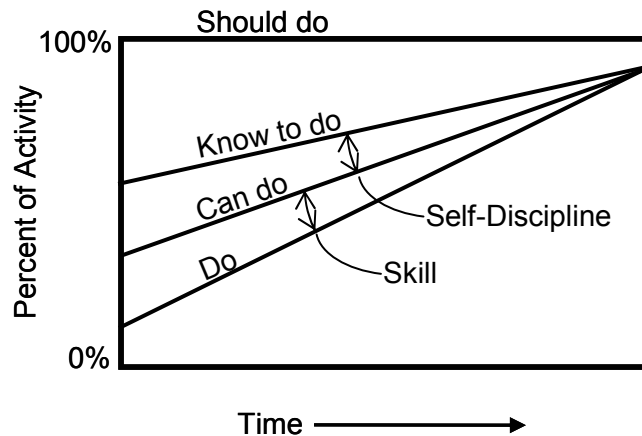
“Organization Purpose, Vision, and Design” is the foundation which defines and sets the direction of the organization. Any organization must first consider its purpose and clearly understand why it exists. Second, the organization must understand its vision, in other words, where the organization is headed. Next, the organization must consider its design. Organizational design will involve understanding business and market needs, development of a viable business model, the selection of business and operational processes, and design of the organizational structure. These are obvious prerequisites for the improvement of any organization.

MANAGEMENT SELF-DISCIPLINE

“Management Self-Discipline” is doing the things we know we should do in the management of the organization. While we all know that we should eat right and exercise, not all of us have the discipline to do so. We may start an exercise program, but some of us lack the perseverance to continue. In management, there are things that must be done, and they are not always fun. Without self-discipline in these matters, managers fail to carry through proper action. This can have a disastrous effect in operations.

The primary focus of Management Self-Discipline is at the head position within an operation, company, or area, such as a plant manager. If this manager does not display self-discipline, self-discipline will not exist among the reporting employees. Things that need to be done will not get done.

Reviewing the diagram below, we find the things that we “*Should do*,” “*Can do*,” “*Know to do*,” and “*Do*.” While training and education can close the gap between “*Should do*” and “*Know to do*,” Management Self-Discipline and skill closes the gap between “*Know to do*” and “*Do*.”



Self-discipline requires awareness, understanding, and belief as a prerequisite. With this, hopefully, appropriate behavior will emerge. Unfortunately, this is not always the case.

There are many companies, plants, and departments that cannot be helped because Management Self-Discipline does not exist. Through consulting and training all that is done in these situations is to increase the gap between what they “*Know to do*” and what they “*Do*.” This can be demoralizing for plant personnel.

The managers with a lack of self-discipline are those that are often in a highly reactionary mode. They could be in the “firefighting death-spiral.” They are not managing the processes and systems they own. Because of this, there is no “Constancy of Purpose,” as W. Edwards Deming used to say. They may start an improvement activity but they do not have the perseverance to maintain it. “Perseverance” means to persist in pursuing something in spite of obstacles or opposition. In this case, they are the obstacle.

Without Management Self-Discipline, any efforts to establish improvement will be a waste of time, resources, and lead to the destruction of morale.

Here are a few examples.

- A company starts a training and communication process meeting with the operators once per month. The first few sessions work well. A month is skipped because of other “pressing” business. One day someone realizes that they haven't had a meeting in three months.
- A company launches SPC methods in a plant. Management lacks follow-through. The efforts begin to fail, and then collapse.
- Employee performance reviews are typically found to be several months late.
- Planning systems are weak. Plant focus is unknown. Asking the plant lead team, “What are the top three priorities?” leads to random responses.
- A plan is in place to require new processes to have documentation of acceptable process control and capability. Management doesn't follow-through and the testing and evaluation is skipped. The reasons given for this situation are simply rationalizations. Lack of Management Self-Discipline is at the heart of the matter.

Unfortunately, this author has had no experience seeing this turned around by an individual when it was a problem at the plant management level. In instances where this was a problem at that level, the problem was rectified by removing the plant manager. That does not mean this is the only solution. This has just been the author's experience. The difficulty in addressing this lack of Management Self-Discipline is that it requires “a significant emotional experience.” It requires something so significant that the individual changes their very nature. It can be done, but it is difficult.

MANAGEMENT-EMPLOYEE TRUST & RESPECT

“Management-Employee Trust and Respect” is having trust and respect between the managing group and the operating group as well as within those groups. In some companies you will find a condition where employees actually hate

the company. They are putting in their time until retirement. They do not trust management, nor do they have confidence in their management's leadership. On the other side, you have a management that has contempt for the workforce. This is an "us" versus "them" situation. What you see in these situations is what might be called "the management-labor death-spiral." You find labor that doesn't trust management and a management that lives up to labor's negative expectations.

Now, if Management Self-Discipline does not exist, not much can be achieved in this area. Once Management Self-Discipline is in place, then the communication channels must be opened and the issues (often trivial, but sometimes deeply rooted) must be addressed, one by one.

Should Management-Employee Trust & Respect not exist, there will be resistance and fighting involved in every step toward improvement.

A comment heard at more than one company is: "You just want standard operating procedures written so you will know how to run the equipment in case we have a strike." Obviously, there is a problem here.

Talking, as in any relationship issue, can be the best antidote. It may be impossible to over communicate. I have been amazed at truly trivial issues have become major barriers in some organizations. Simple communication can go a long way to resolving such problems. Communication is the first step to achieving Management-Employee Trust and Respect.

HOUSEKEEPING

"Housekeeping" is keeping a neat and orderly workplace. If a company cannot keep its house clean, forget trying to keep processes in control. If the discipline for housekeeping is not there, the discipline for maintaining control, improving safety, and improving processes will not exist.

Housekeeping has both practical and psychological implications. From a practical standpoint it is a foundation for achieving safety, creating order, and producing quality product.

Some Japanese factories have been described as "parlor factories." You must take off your shoes before you enter the factory. The "parlor" is the room where the Japanese entertain their guests. They keep it very clean. They seek to make the factory a showcase that will sell their company to a prospective customer.

This philosophy is based on the idea that in order to produce quality product you must work in a quality environment. The Japanese often talk of 5S, which has become popular in recent years in the United States and other countries. The five S's are Seiri (organization), Seiton (tidiness), Seiso (purity), Seiketsu (cleanliness) and Shitsuke (discipline). 5S is a discipline of systematically improving housekeeping.

There is also a psychological side to housekeeping. Clutter and lack of order create stress, lower morale, energy, and focus, and hurt pride. There is also a greater drive to maintain cleanliness when the environment is clean than when it is dirty. The Chinese art of Fung Shui deals with establishing a harmonious environment. The Chinese subscribers to this system believe the environment affects the inner and outer lives of people. This may be more true than is often realized.

If a company finds it makes a special effort to clean the plant when important guests are expected, the company has a problem. Obviously, this is a symptom of lack of Management Self-Discipline, and that no system exists for continuous improvement in housekeeping.

Housekeeping is not rocket science. Ownership can be given to shop floor personnel with expectations clearly set. This is often a good place to start improvement efforts, because it is visible, and will have effects beyond just the removal of clutter.

Keep this in mind: if you cannot keep your plant or areas clean, what would make you think you would be capable of maintaining a high level of quality?

MAINTENANCE

“Maintenance” is having equipment maintained in satisfactory operating condition.

This author has been at companies where I told them, “If my car was in the condition of your equipment, I would not take it on a long trip.” There are plants where they use rags for oil dams, use duct tape and cardboard for temporary fixes (which remain permanent), have missing nuts and bolts on their machines, and have machines out of alignment. These same companies then want to implement a suggestion system! Forget it!

We are not talking about Total Productive Maintenance (TPM), we are talking about just being able to keep machines in a standard operating condition. If a plant cannot keep its machines up to par, forget trying to rescue it with Statistical Process Control or any other methodology. This problem is often found with a reactive maintenance strategy that is underfunded and understaffed. Often this is the result of a management that does not understand the concept of preventative maintenance let alone Total Productive Maintenance. This may also result from a lack of Management Self-Discipline.

The objective should be to move to a level of maintenance that delights. As it is said at Toyota, the worst condition of a machine should be when it is brand new! From then on they continually improve their machines.

Forget trying to produce quality product in an environment where the machines are beat to death. An organization must show respect for the equipment from which its livelihood springs.

If the maintenance level is poor, housekeeping is satisfactory, and Management Self-Discipline is in place, maintenance is the place to start.

STANDARDIZATION

“Standardization” involves defining and standardizing the organization’s processes and the development and implementation of common operational practices.

Control cannot be maintained if standardization does not exist. A simple test to evaluate a plant is to watch what happens at shift change. If the first thing operators do when starting their shift is walk up to their machines and change the settings from the previous shift, there is a problem. This could indicate that no one knows how to run the equipment.

From a quality perspective, achieving reduction in variation in outputs will require reduction in variation in inputs. If processes are to be controlled, the methods of input have to be controlled. Several excellent operators can be brought together, each operating with their own technique, and the result when combined together is mediocre output. The principle is continual reduction in variability of process operation.

Many people think having a written SOP (Standard Operating Procedure) or “work instruction” means they have standardization. This is a misconception. An SOP is a “state” not a “document.” An SOP can be defined as follows.

“A state of consensus among the operating personnel on the methods used for the operation of a process.”

Standardization is much more an issue of people management than technology management. The operating personnel must have ownership in the standardization process.

Generally, standardize first, then optimize. It is almost impossible to improve an unstandardized process.

From a review of standardization activity in a number of plants and departments, it is not uncommon to see nonconforming rates cut in half simply from the standardization efforts.

If standardization cannot be achieved in process operation, problems will occur in trying to achieve process control. And if the discipline to maintain standardization does not exist, forget about improvement.

CONTROL

“Control” is the ability to achieve stability of processes, maintain gains, and prevent backsliding. We may define control as our ability to prevent nonconformance and constrain variation over time. Various technologies may be used to achieve an acceptable level of process control.

Just as civilizations rise and fall, so do processes. Not only does continuous improvement require continuous effort, but simply maintaining requires continuous energy. The ability to control processes is a critical capability of a company. Without an ability to control processes, improvement will not be sustained.

As an example, one company spent close to two million dollars on experimentation to optimize a new process. The initial results favorably impressed their customers. Following this experimentation, control methods were not put in place. Ultimately, the process degraded to the point where the customers became dissatisfied.

With an ability to control processes, the organization is then ready to tackle improvement. With control methods in place, they will have the best chance to achieve stability and prevent backsliding.

IMPROVEMENT

Finally, we get to “improvement.” If we have addressed the lower elements of the hierarchy, we have the discipline to maintain our systems, we have a quality environment, machines at an acceptable level of repair and operation, we have effective standardization and an ability to control our processes. We now can seek improvements in the fundamentals of the organization, as well as strengthen the lower elements of the Improvement Hierarchy. We have an infrastructure which will support and sustain our improvements.

We can continually improve the elements found in the hierarchy. We can move from elimination of clutter to an increase in orderliness and improvement in appearance. We can move from preventative maintenance to Total Productive Maintenance. We can enhance the safety of our employees and their well-being. We can optimize our products and service to increase customer satisfaction, delight, and loyalty.

An organization must begin their quest for improvement by understanding their purpose, where they are at, and where they wish to go. The organization must inventory their business and market needs and understand the relative importance of those needs. The organization must possess knowledge of their current state. This will involve measurement and analysis. Improvement is difficult without measurement. Improvement can take place with only an understanding of theory, but measurement provides the feedback to ensure the right and optimal actions are taken. With knowledge of the current state, the desired state, and the relative importance of the business and market needs, improvements can be prioritized and selected. The organization is then ready to deploy improvement activities.

The effectiveness of improvement activity deployment will be a function of an organization’s “executional capability.” Executional capability is the ability to rapidly bring about beneficial change. Some of the elements that might be found in executional capability are as follows.

- The ability to use systematic improvement strategies
- Organizational learning capability
- Teaming capability, knowing how to use teams, and knowing when and when not to use teams
- The ability to manage resources effectively
- Effective project management
- Having an organization improvement structure to manage deployment and improvement
- Employees having the knowledge skill and experience

In general, systematic improvement will involve the following steps. These are generic steps that will be found in many systematic improvement strategies.

1. Defining what to improve
2. Understanding the current state and the desired change
3. Determining what variables must be manipulated
4. Determining how to manipulate the variables
5. Implementing changes
6. Evaluating effectiveness of the changes

7. Standardizing and controlling the new state
8. Institutionalizing the changes

As an organization strengthens its improvement capability and continually deploys that capability, it will advance the condition of the organization. Improvements in safety, quality, cost, delivery, efficiency, speed, environment, innovation, and morale will result, as well as customer satisfaction, delight and loyalty.

HINTS ON THE USE OF THE IMPROVEMENT HIERARCHY

You will find that organizations will need to address the level at which its major weaknesses occur. Within a plant, this can vary from area to area. Improvements teams must address the lowest elements of the Improvement Hierarchy that need to be addressed. If they work at higher levels, they will ultimately encounter difficulties. The theory does not say you cannot work on higher levels of the hierarchy first, it says that if you don't you may have difficulty sustaining what you do.

CASE EXAMPLE

Let's return to the supplier mentioned at the beginning of this article. As it turned out, the customer ultimately made the decision to desource (eliminate) this supplying plant. That was serious because over 50% of the business for this plant came from this one customer and the plant would not be able to stay in business. As it turned out, the customer made the decision to desource the supplier on a Thursday, and on the following day, Friday, they were told that another one of their suppliers had just bought the plant. Because of the success the other supplier's company was having at its other plants, the customer made the decision that they would not completely desource this plant, but would restrict the volume until things had turned around. The customer requested a plant manager from another plant of the purchasing supplier oversee the transition, and this author, at the request of the company was also sent in to give guidance. What followed was an example of the Improvement Hierarchy elements being addressed one-by-one.

Clear direction was given to the plant. A mission statement was given to the plant by the customer. The mission stated that in order to be considered for future business, they were not to have more than a given number of complaints issued against them by a certain date. The plant knew what had to be done.

First, the former plant manager was terminated. He lacked the self-discipline and leadership needed. One-third of the plant was laid-off. The new acting plant manager took control. He mentored the former plant foreman to ultimately lead the plant. A plant steering committee was set up consisting of plant management and operators. They helped guide the improvement of the plant.

The "Management-Employee Trust and Respect" issues were addressed. This happened to be a union plant, but the union was very cooperative. Slogans are generally not very effective, but this plant had one that was. Their slogan was "Quality means business," and every employee knew that people lost their jobs because of quality problems. The troops rallied, and the management treated them with respect.

The plant was cleaned out. The junk around the plant was taken to the dump. Excess inventories were driven down. The housekeeping issues were addressed. There was a night-and-day difference in the plant. You could see across the plant floor, where before you could not because of the clutter in the way.

The acting plant manager brought in specialists from his other plant to assist in the rebuilding of equipment. They had a furnace that was in poor shape. The furnace was taken out and replaced with a refurbished unit. All their maintenance problems were addressed, one by one.

They worked on standard operating procedures and ensured operators were adequately trained. Problem-solving teams addressed the control issues and made breakthrough improvements.

This change was one of the most rapid turnarounds this author had seen. In less than a year, this plant went from one of the worst quality plants in the customer's system to one of the best. The mission, which had been given by the customer, was achieved. The plant volume, which was originally reduced to one-half by the customer, was restored. The gains in productivity were so great during this time that they did not have to hire additional workers. They were capable of the same volume with one-third less of the original workforce. Incidentally, the company then put other manufacturing lines in the plant to service other customers that allowed them to bring back former workers.

What this case example shows is that fundamental issues had to be addressed. They were addressed and sustained improvement resulted.

CONCLUSION

The Improvement Hierarchy presented is a theory of possible elements which must be addressed, building on top of each other, if sustained improvement is to be achieved. There may be other elements, and certainly outside the manufacturing arena there are analogous elements. The Improvement Hierarchy as presented has proved useful over the years to better understand the needs of various organizations desiring to bring about sustained and continuous improvement.

This paper does not suggest that the Improvement Hierarchy presented is the “true” and only hierarchy, it only suggests that there is one.

REFERENCES

Maslow, A. (1954). *Motivation and Personality*. New York: Harper.