Improving Processes and Focusing on Value

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Improving upon maintenance processes has become a fundamental part of running a business for maintenance managers. Multiple mini-process tools have been developed to help managers uncover poor processes performed in plants; such as Follow the Baby – Observing a work order from birth to maturity, or DILO studies – "Day in the Life Of." The real question is what should be done with the information once it has been gathered? You will find that the answers are unique to each industry; however, the methods for utilizing this information are universal. The following are key considerations used to aid maintenance organizations in improving their processes regardless of whether a plant is producing medicine, auto parts or providing electricity for an entire city.

All of the mini-process tools listed in Figure 1 offer the maintenance department a measurable way to assess the effectiveness of the activities being performed by craft workers. The tools each illustrate specific improvement opportunities. The result of using these tools also provides the baseline to measure improvements as they are executed.

Mini Process Tools	Results of Tool	Next Step
Value Process Mapping	List of process activities	Determine activities that add value
Work / Time Analyzer	Chronological list of activities with estimated times	Determine activities that add value
Follow the Baby	Sequenced steps of an actual work order from request to close out	Determine activities that add value
DILO "Wrench Time"	Chronological list of activities with estimated times	Determine activities that add value

Figure 1

These tools, which help identify specific work details, have a common thread: the need to understand value versus non value for the activities uncovered. It is recommended that you conduct a mini-process on one of your technicians if you haven't done so already to discover more details of how their time is actually spent. Evaluating and acting on the data collected is the next key step toward success.

Regardless of the task being observed (receiving at stores, corrective work orders, planning work, or rebuilding a motor), the detailed observations require an understanding of what is value added and what is non value added. Once the data has been collected and coded for the type of value it represents, the steps taken to reduce or eliminate the non value activities are not always clearly defined. This is where many organizations run into difficulties. For example, we may know a technician has 3 non value added steps in his daily routine, but how do we eliminate them?

Figure 2 - Value Added versus Non Value Added Activities

Here are the basic definitions to understanding value versus non value activities.

- **Value Added** – any activity or action that enhances the value of the product or service (Would the customer pay for this?)
- **Non Value Added** – any activity or action that would not enhance product or service value
  - **NV Essential** – any activity or action which is reasonably required to perform a value added function (examples, lock out procedure, or a safety inspection)
  - **NV Non-Essential** – any activity or action which is not reasonably required to perform a value added function (rework, returning to the tool crib, 2nd and 3rd trips to the storeroom for parts are all examples)

Here are a few considerations to keep in mind when choosing priorities:

First, not all waste can be eliminated. There is a subset of non value work that is required to stay in place, called "non value essential." Walking is an example of a non value essential activity; however, it is still required that we walk to the equipment in order to fix it. For this and all other non value essential activities, it is important to reduce the duration as much as possible. For items that are purely non value and non essential, like showing up at the equipment with the wrong wrench, it is important to strive to eliminate this waste all together. The word WASTE is used it is in the context of the Japanese Toyota Improvement Model which divides waste into seven categories (See Figure 3). All of these wastes occur every day in our jobs. Taking action to reduce and eliminate them is up to the leadership group.

Figure 3

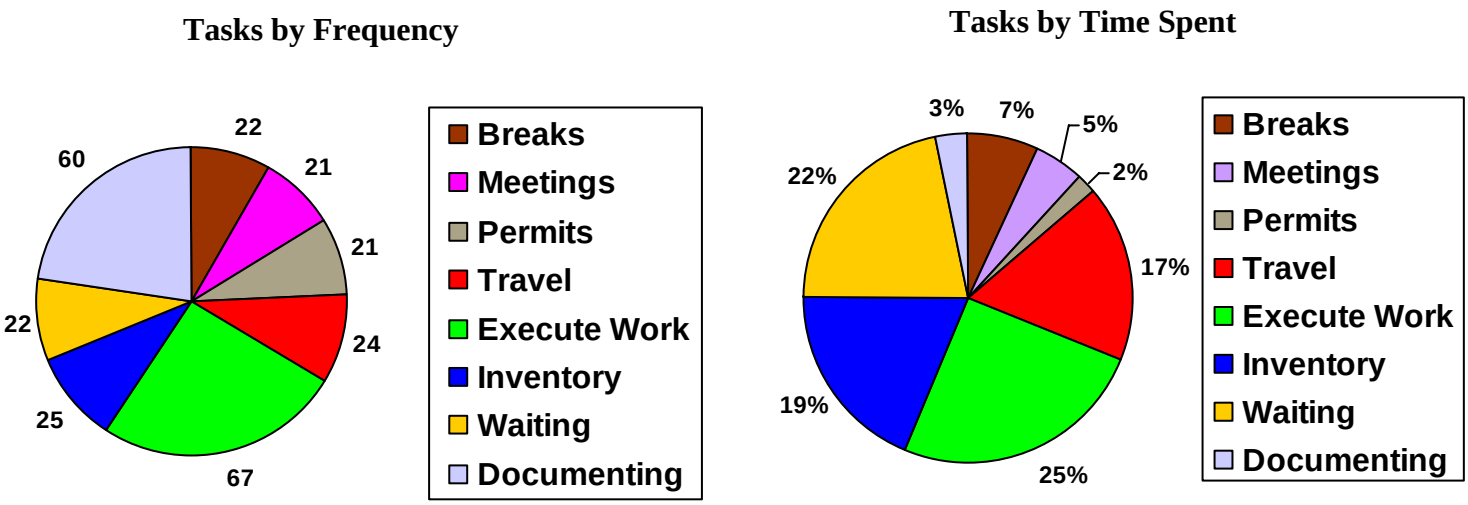
1. **Overproduction**, typically using machines faster than necessary as long as they have any parts to process.
2. **Waiting** for a machine to complete an automatic cycle or for parts to arrive.
3. **Unnecessary transportation** relocating parts at any time in the process
4. **Processing itself,** reduce or eliminate any non-value added steps within the process.
5. **Inventory** on hand beyond any need to support normal operations.
6. **Movement** unnecessary searching, reaching, carrying, or positioning parts.
7. **Defects,** producing out-of-spec goods.

Although the application of the seven wastes was designed for the operations/production section of the manufacturing plant, the principles remain valid for maintenance activities. An adjusted list, which includes the maintenance activities, of definitions may look like this:

1. **Overproduction**, rebuilding 5 electric motors despite the need for only 1.
2. **Waiting** for a machine to become available to PM.
3. **Unnecessary transportation** or reducing trips to the store room.
4. **Processing itself,** conducting PMs when they are not needed
5. **Inventory,** bringing 6 lengths of pipe jacketing to a job when you only need 2.
6. **Movement,** leaving the hand tools on the ground when the job is up on a mezzanine and climbing back and forth.
7. **Defects,** accepting temporary repairs, or causing additional errors while executing a PM.

The second thing to take into consideration is that although you may find an improvement opportunity that appears to be able to provide a 42% savings over current cost when measured, it is unlikely that all of this opportunity will come to the bottom line. A range of success occurs with every change that is put into place. In maintenance/engineering, processes are interdependent with many other departments. Improving these opportunities will likely require cooperation from multiple departments. Experienced change management / cost reduction specialists will typically predict 50-60% of an opportunity identified will likely be corrected in the near term. In the case of a 42% opportunity, communicating a goal of 21% improvement may be recommended. If the goal is exceeded, raise the expectation and continue to make improvements.

The third consideration is that when deciding how to prioritize elimination of operational waste, think of it in terms of what the idea is worth. If you are eliminating waste from a process that only occurs once every 4 years, reconsider the overall value of the process before spending valuable time redesigning the processes. Along with quantifying the opportunity, make sure that the frequency as well as time spent on the task is evaluated (Example Chart 1).



Chart(s) 1

These charts represent the work of three technicians over a one week period by *frequency and by time spent*. The first chart illustrates that *executing work & documenting work* are the dominant tasks. These tasks are the activities that bring value to the maintenance organization - when the technicians are executing work orders and documenting what they have done. Life is good, right? Before you answer that question, look at the second graph that displays tasks by *time spent*. By looking at this chart, there is a whole new picture to evaluate. What is going on with all the waiting and inventory time? All of this non-value work is eroding this technician's time from getting the value added activities completed. Whose fault is it, the employee's? It is typically the business processes that have been established that are preventing the technician from effectively completing his work. Sometimes, the processes are established by default and are completely unintentional. Regardless of fault, it is up to management to review the steps of the process and eliminate or at a minimum reduce the non value steps to provide the employees a smart work environment.

Another consideration is the difficulty in rating the proposed change. The proposed change may be as simple as telling the technicians to start using the back gate and can be as tricky as recommending a new computer system for a whole organization to adopt. The level of effort will vary significantly with the proposed change. The level of difficulty of the change should not stop anyone from making the best recommendations for the overall organization. The point is to be smart about the task at hand and organize your facts before you execute.

Some organizations go a step further with their analysis and combine ROI with difficulty in order to come up with a composite rating that looks at benefit versus effort. The effort can be measured in dollars, labor hours, or even a bid from a contractor. The benefit can be measured in dollars, cost avoidance, or improved service. Developing a fair estimate for the ROI, as well as the effort cost, is a good business practice before making any changes.

Using these simple guidelines will help get organizations over the difficult step of determining what processes should be improved. Understanding the difference of value added versus non

value added is a great lesson for everyone in the organization to know and appreciate. Employees at all levels can begin identifying opportunities for improvement when they have been educated to the concept of value versus non value. All involved must recognize that removing all waste is impossible, accepting partial improvements is expected, determining the value and priority of the actions is important, and finally appreciating the difficulty rating are all instrumental in determining which maintenance processes should be improved and in what sequence they should be addressed will help maintenance managers get to the next level of positive change and improved reliability.