

Synchronous Solutions

The continuous pursuit of excellence

The Hawthorne Effect By Ed Hill Synchronous Solutions

Give people some of your attention and their productivity will improve. That is called the Hawthorne Effect.

The Hawthorne effect explains the condition in which people modify their behavior in response to their awareness of being observed.

The Hawthorne effect is named after a series of engineering experiments that took place at the Western Electric factory in Hawthorne, a suburb of Chicago in the 1920's. For almost a century, this has become known as one of the most important and revealing psychological/engineering studies ever done in a workplace. At that time, the Western Electric Company was the sole supplier of telephone equipment to AT&T. The Hawthorne plant was a state-of-the-art facility that employed about 35,000 people. The engineering experiments were intended to study the effects that workplace changes had on output. The hypothesis was that certain workplace changes would improve productivity. Groups of workers were studied to see if different lighting levels, improvements in cleanliness or different placement of workstations affected output.

Initially, lighting levels were increased in a work area and productivity improved. Later, lighting levels in the same area were decreased and productivity improved again. At another time, light fixtures were altered by technicians, but the lighting levels were not changed. Productivity improved yet again. At one point, workers were told that "better bulbs" were being installed. Actually, the original bulbs were reinstalled. The workers reported that the new bulbs were much better.

The conclusion of all this was that the workers were responding not so much to the changes in their workplace, but to the attention that management was giving them. The company also realized that when all this attention was ended, productivity levels returned to the state prior to the experiments.

The Hawthorne Effect is a reality. People will respond to orders, direction, coaching, even "reading the riot act." Those efforts do pay off with greater productivity. But the problem is that unless systemic changes are made in the method and procedures of the work, the improvements will not last.

Lasting performance improvements
require systemic change.

The fact is, to make enduring improvements in performance, there must be changes in the way the system works. Demanding, preaching, threatening, and even firing to make a point, will not alone assure *permanent improvement in performance*.

Insanity is defined as expecting
improvement while continuing to use
the same old approach.

So, if you conclude that changing the *system* is required, the questions become:

- What to change?
- To what to change?
- How to accomplish the change?

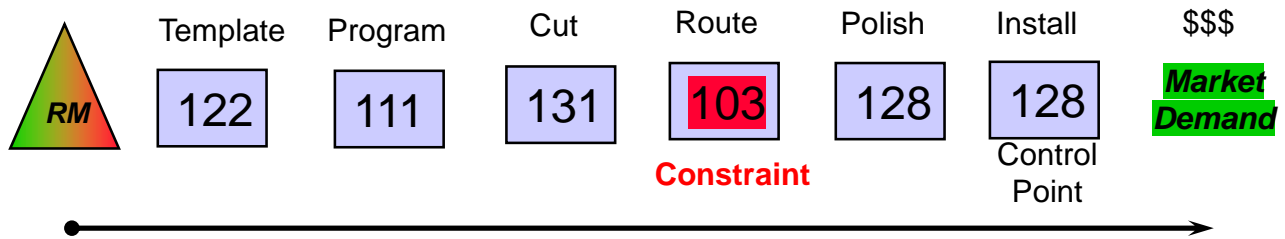
What to Change?

Every system, without exception, has a constraint. Like a chain, a business system is only as strong as its weakest link. Moreover, improving the performance of a of a link that is not the weakest will not strengthen the chain.



So, to improve your system, you must first know where your constraint is. A simple way to do this is to map the system on a wall chart, including the *demonstrated capacity* at each workstation, so that the data is clearly visible for all your operations leaders. It is important to post the *actual demonstrated capacity*, not what you want it to be or what the equipment vendor says it should be. Every company is unique, and you need to know the reality of your performance. Post the facts of your *demonstrated capacity* at each process step.

Process Flow with *Demonstrated* Capacity per Hour



Clearly, in this example *Route* is the constraint of the system. It is the weakest link in the chain. Increasing the capacity at any other location will not increase the capacity of the system. This is the one place the company should focus on to increase overall system capacity.

Install is labeled the Control Point because this is where “the cash register rings.” This should be the point of daily system scheduling (using Throughput Dollars \$T rather than square feet) and all functions should strive to produce to the daily schedule. The amount of that schedule is limited by the constraint of the system (*Route* in this example).

To What to Change?

So, if the market demand is strong enough that an increase in capacity is needed, there is only one place in this example to start...Routing. Every ounce of increased capacity there will increase the capacity and productivity of the entire system. Working anywhere else will not create more productivity for the system.

How to Accomplish the Change?

It is not always necessary to add people or overtime hours to increase productivity. Usually there are better options (and much less expensive) that we call *exploiting the constraint*. Those activities would include:

- Giving the constraint function priority for maintenance. In other words, if the constraint machine is down, it takes priority over everything else. The reasoning is that it determines the capacity of the entire system. When it is down for maintenance, the system capacity essentially goes to zero once the WIP is depleted. Conversely, when a non-constraint machine is down by definition it has the *protective capacity* needed to replenish the WIP serving the constraint.
- Assuring that the best and most reliable workers are assigned to the constraint. People with good work habits, excellent attendance, high quality practices, and adherence to the workplace safety standards should be assigned there.
- Work the constraint resource through breaks and lunch. If it is your system’s constraint, it should never stop during the workday. Rotate other people to the constraint so that it never stops. This is also a benefit in training for backup workers at this critical process.
- Offloading any unrequired activities from the assigned constraint operators. For example, staging new cut pieces to the machine, assisting in the loading onto the beds and offloading finished pieces for the next operation. The role of these assist operators is to make sure that the constraint process never waits for work or is required to perform any duties except the basic running of the machine.
- Engage in a set-up reduction project. This project, called SMED (single minute exchange of dies) is a standard Lean activity. Our experience is that diligent effort on a SMED project can cut the current changeover times in half.
- Assure that the daily schedule supports the productivity of the constraint process as much as possible.

Only after all the above has been implemented should the company increase the run hours of the constraint resource. If/when more hours or workers are assigned, it is possible that the constraint could move to another function in the plant. While the constraint can move, there will always be one. If it does move, then the steps above should be applied to the new location.

Lasting improvement *only occurs*
with systemic change.

The goal of a company is to “make more money now and in the future.” (from The Goal by Dr. Eliyahu Goldratt). That means that the system should be designed to be as productive as possible in the current market conditions and to be set with *continuous improvement* practices to assure that it can adapt to the inevitable growth in market demand,

The Hawthorne Effect is a reality. But, if you rely on it to increase the capacity, productivity, and profitability of your company, you will be disappointed that the results will not be lasting. The only way to create improvement that lasts is to change the fundamentals of the system itself. Consider three questions for you and your staff:

- What to change? Identify your system’s constraint and focus there first.
- To what to change? Consider the things you can do to assist the constraint operation without investing in more equipment or staffing.
- How to accomplish the change? Having clearly identified the constraint, *exploit* it. Give it maintenance priority, assign the best people, schedule it to operate all day even through breaks and lunch. Offload functions that can be done by someone else who should have available capacity at a non-constraint function. Plan a set-up reduction project and make sure the schedule supports productivity at the constraint resource.

The Hawthorne Effect will get you some temporary and fleeting productivity improvements. But it is a mirage. Making the right systemic changes to your processes will bring you lasting performance improvements.

For more information on The Hawthorne Effect and how make lasting productivity improvements so that you are prepared for the coming resurgence of the economy, contact:

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