The Scheduling Dilemma
Part II

In Part I of this article we discussed the root cause of the scheduling problem. In the next table the desired result is what we are trying to achieve, the necessary conditions are those things that must be accomplished to get the desired result, and the conflict forces us to chose between one of two necessary conditions.

Desired Result	Necessary Condition	Conflict
Manage Well	Improve company performance.	Focus attention on the measurements that result in improvement for the company overall.
	Improve departmental performance.	Focus attention on the measurements that result in improvement in my department.

The Solution

In order to find a solution to our problem we ask three logical questions and address the answers in an action plan. The questions are:

1. What to change?

2. What to change to?

3. How to cause the change?

We know from our analysis the root problem is caused by the way we measure success in the company. If each department has a different measurement for their success there will be no clear plan to make improvements for the entire company. What should be the measurement of success and improvement for the entire company? How does each department and employee interact and support the effort and plan to deliver the improvement? What are the plans and what systems are needed to support these plans? Once we have the answers to these questions we can begin to eliminate the current undesirable effects we see in the current system.

Assumptions:

There are underlying assumptions in the entities we have listed as necessary conditions. What are some of the assumptions that create the core conflict? It is assumed that the way to manage well is for every department to make improvement. The cumulative improvement would result in an improvement overall for the company. Therefore we can claim if we improve the departmental performance then we are managing well. So how do we define this departmental performance? Here is where we see measurements like; units per man-hour, uptime vs. downtime, on-time performance and so on. Is it really true that for the company to improve all departments must show improvement in these

measurements? Our conflict has at the core these measurements used in the system. Are there conflicts that are created by the measurements themselves?

What is the capability of the chain?

10 Sales
16 Purchasing
12 Warehouse
15 Order Entry
8 Picking
14 Ship Billing

$ Profit

???
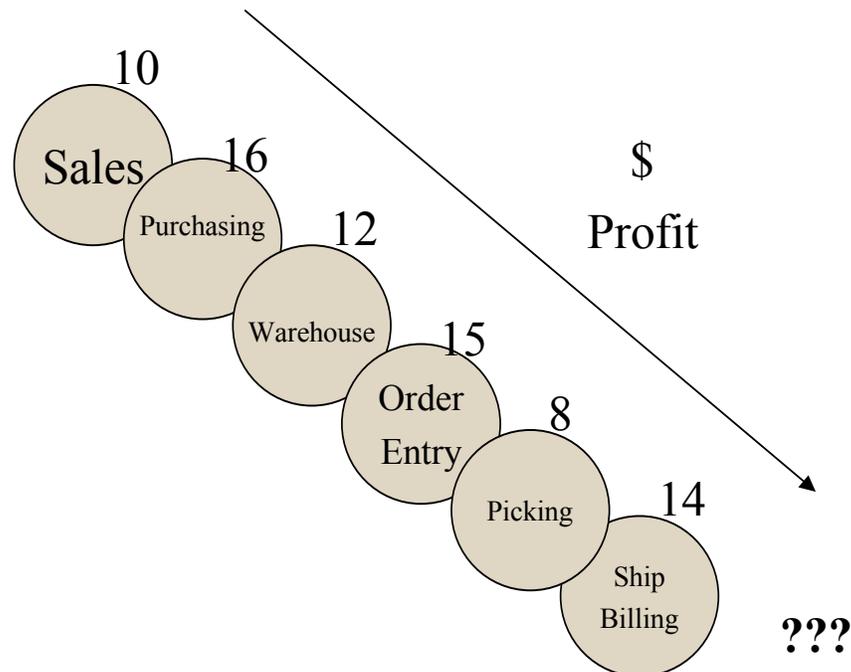
Like Links in a Chain.

Constraint Management

Our assumptions indicate that all improvements in the company have the same impact to the overall performance of the company. Is this assumption valid? Let's look at the capability of the chain in the diagram. We have calculated capacity values for each of the functions in the process for the figure. It shows

sales could do ten units of measure, purchasing could do 16 units of measure and so on. With these capacity values what is the capacity of the entire process, what is the process able to deliver? The chain is only as strong as the weakest link. This results in an ability to deliver 8 units of measure due to the constraint at the picking operation. This result is unavoidable and consistent unless we make a change to improve the capability of picking then the capability of the operation will not improve. What will then be the result if we make a departmental improvement in the warehouse operation to increase that capability to 15? There will be no global impact to the company ability to deliver 8 units of measure. Then how can the claim be made that the warehouse department manager is indeed managing well? He has made no impact to the performance of the company. In fact often the isolated departmental improvements have a negative impact to the overall company improvement.

For example if the company must make a capital investment for the warehouse improvement to be implemented what then will be the return on that investment? There will never be a return because there is no improvement to the global performance of the company, the investment is a waste and any efficiency improvement in that department is just a mirage. Many times the focus on local department improvement results in process or policy changes that result in making it harder for the constraint to perform. To make an efficiency improvement in the warehouse we eliminate one person from the staff. That person sometimes helps out by printing the pick tickets for the next operation.

Now picking must print their own tickets and the end result is a lower capability for picking. Not just for picking but for the entire operation!

What to Change

Constraints Management offers us a clue to make improvements in our operation. The basic thing that must be changed is the assumption that local improvements will result in global company wide improvements. Once this assumption is changed we can change the way we measure improvement in the company. Managing the constraint forces us to get the best possible performance out of the entire system. This is defined as to getting the most out of the weakest link or the constraint. We say the constraint sets the pace, or the drumbeat for the chain. The most that can be accomplished is what the constraint can accomplish.

What to change to

To get this level of performance our scheduling system must identify the constraint in the routing and subordinate all the supporting work centers to meet the requirements of the constraint. This sounds simple enough to do but then Murphy's Law strikes us! Murphy's Law states that whatever can go wrong will go wrong. For the scheduler this means whatever you planned to do will not always work out. So the problem is how do we protect the constraint from suffering from Murphy's Law? We need to place a buffer of time in front of the

constraint to protect the constraint from anything that might impact the work

centers that feed the constraint. This will minimize the impact the constraint

would feel from Murphy's Law. So we need a scheduling that can calculate the

buffers required to protect the constraint from Murphy. In summary the

requirements to make true improvements in scheduling is to identify the

constraint and to place the buffer to protect the constraint and manage the other

work centers to maintain the buffers that are required.

How to Cause the Change

Most current scheduling systems do not utilize the Drum and Buffer

approach to scheduling. Many companies are running MRP or MRPII approaches

to scheduling, which provide helpful information that is needed in the business

these approaches do not give us the constraints approach that we need. In fact

most of the time if we do schedule from MRPII approach it leads to more

departmental conflict and more focus on local improvements. What is needed is a

system that incorporates the constraints approach that gives optimal solution we

are seeking.

Companies that are implementing this approach need utilize the Focusing

Steps of the Process of Ongoing Improvement:

1. Identify the Constraint

2. Exploit the Constraint

3. Subordinate to the Constraint

4. Elevate the Constraint

5. Go Back to Step 1

If the Process of Ongoing Improvement is implemented and the Buffer Management of the constraint is controlled it is easy to optimize the schedule for the company.

Credits:

Eli Goldratt <u>What it this thing called the Theory of Constraints.</u>