The Goal

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The Goal is the story of Alex Rogo and his plant owned by UniCo. Mr. Rogo is the manager of the plant. At the beginning of the story, the plant is out of control. A focus to keep everyone busy hides true high-priority orders, until the customer calls to demand the job immediately. Work in progress inventory is stacked everywhere, but not much seems to ship without a “drop everything” intervention. Mr. Rogo meets one of his old professors, Jonah, who gets him to focus on the bottlenecks of his plant and building actual customer orders. Jonah teaches him that making the plant look busy by building to inventory does nothing for the bottom line. After this and several other improvements, Alex is able to turn the plant around and he is promoted to district manager as a reward.

1. A bottleneck is any process which is processing less than the demand put on it by outside sales. At first, Ralph, the computer guy, tries to find the bottlenecks by going through computer print outs. However, he quickly finds that these are out of date. Next Alex’s team talks to the expediters to see where they often saw problems. Finally, the team decides to just go out on the shop floor and look for what step had the highest WIP inventory pile in front of it. They find two: the NCX-10 and the heat treatment machine.
2. Jonah believes that a bottleneck should be solved at almost any cost. The cost of the bottleneck is equal to the hourly cost of the entire plant, because it is constraining the capacity of the plant. Almost any steps should be taken to increase capacity. For example, setting up a second machine or process, even if it is less efficient, would help relieve the bottleneck. In addition, if the resource is sitting idle, dedicate additional personal so that the machine is never idle. If necessary, reschedule lunch so that lunch is taken when the machine is running. At the heat treat machine, Mr. Rogo stations dedicated employees at the machine all three shifts. In addition, one of the employees figures a way to stage the parts so that they can be loaded quickly. The employee also realizes that he can load lower priority parts that need the same temperature in excess space in the furnace. Lastly, if one is very behind, one can use an outside firm to catch up on a large batch of items. As long as the cost of the improvement is less than the cost of running the entire plant, the improvement to the bottleneck is necessary.
3. Two part question:
	1. We have worked with *dependent events* and *statistical fluctuations* in class before. We know that certain events take a pre-determined amount of time. For example, a robot’s production is 25 items an hour. Period. It can’t move any faster. However, some events may take a random amount of time. Humans sometimes have a good day and sometimes have a bad day, where they work slower. In addition, some events may not occur every day, for example, your supplier in Japan is hit with a tsunami. Calculating how long a dependent event will take is easy, but predicting statistical fluctuations is much harder. Both need to be taken into account when managing a system, as is shown in chapter 17 where a team manages to their step on time, only to have the robot backed up and they can’t ship the entire order.
	2. What Jonah said is that a factory that tries to balance capacity with demand will go bankrupt. We learned in the class that we should try to make all steps take an equal amount of time to have the factory be most efficient. Jonah feels that this cannot be done in real life. Capacity takes some time to ramp up and down. Hiring and training a worker takes weeks. A worker cannot be fired without problems from the union and lower morale for the employees. On the other hand, workers can leave at any time, leaving the system in a lurch. All of these things will quickly break a carefully balanced a plant. However, Jonah believes that once should try to balance the flow of product through a plant with the demand from the market. There is little point in making stuff just to stay busy. Even if you are making something to stock, it should be to meet a certain safety stock target, and then it should be lower priority.
4. How I understood it, smaller lot sizes allow the factory to be more responsive to the demand, giving quicker response times and lower lead times. These lead to an advantage in the marketplace, as it is one of the things customers look for when deciding where to purchase from. However, smaller lot sizes also require multiple set up times. Obviously there is a sweet-spot where the tradeoff between the two effects is equal. Smaller lot sizes also does not force the plant to make a bunch of items for stock at the same time as a customer order, tying up capital in finished inventory. A large stock of finished inventory also discourages the introduction of new products. In addition, smaller lot sizes also reduces the wait time that parts face at non-bottleneck stations, further reducing WIP inventory and saving capital and space.
5. Optimally, the market should be the bottleneck. Any step or process in the plant should be able to be scaled up to reach the new order. That way the factory can take all of the orders that it can, in order to make the most money.
6. I really liked how the book tied the operational issues in with an interesting story. I would perhaps make the example plant more specific, by providing more data on this plant. I realize that the authors wanted to make the plant sound like a generic plant, so that managers from any industry could apply the lessons. However, I would like to see more of the details, like were shared during the hike, to study this plants old and new performance more in-depth.