

The Goal

(by Goldratt and Cox)

The Goal is recognized as one of the most important business books ever published. It contains a message for all managers and explains the ideas which underline the Theory of Constraints. The main character is Alex Rogo, who manages a production plant with an uncertain future. Bill Peach, a company executive, tells Alex that he has three months to turn operations at his plant around from being unprofitable. Jonah helps Alex solve the plant's problems by explaining many fundamental business concepts.

1. Analyze the relationship between the Boy Scout hike and Alex's struggles at the plant.

The Boy Scout hike helped Alex realize a fundamental theory in operations management, the theory of constraints. The boy scout hike was a representation of the workflow in the plant. Just like the plant, the boys were constrained by their slowest scout, Herbie. Throughout the hike, Alex was able to develop an approach and solution for his plant.

Identify the bottlenecks, manage the bottlenecks, synchronize the flow, and continuous monitoring of the process to implement adjustments. He used these approaches to identify Herbie to be the bottleneck, just as he did the NCX-10 in the plant. He managed the bottleneck with the scouts by placing Herbie at the front of the line and allowing some of the other, faster, kids to carry his things.

It wasn't as simple with the plant, he couldn't move the NCX-10 but he could redistribute some of the workload to other, older, machines and increase utilization of the NCX-10 by reducing down times, and increasing run times. With Herbie at the front of the line, carrying a lighter load, he was able to set a better pace and synchronize, the flow/pace for all the other scouts. Everyone stuck together, no one was left behind. Alex utilized this concept by synchronizing the flow of the plant according to the NCX-10, distributing some of the workload to other machines and processing more critical orders first.

2. What were the bottlenecks that Alex and his team exposed and what techniques did they use to increase the capacity to improve profitability?

There were 3 processes in Alex's plant that caused bottlenecks. First was the NCX-10 machine due to the machines limited capacity to handle the throughput that was required of it. Next was the heat-treating process due to the limited number of products that could be processed and the amount of time it would take for the machine to complete its work. Lastly was the assembly and inspection process that caused issues due to the workflows and QC issues.

Alex and his team put into place some actions that would increase utilization and efficiency, redistribute the workload, optimize processes, created a team focused on improving and monitoring the efficiency of the plant, set a prioritization standard for the

plant. To increase the utilization for the NCX-10 and the heat-treating process, Alex and his team increase the operational capability by making sure that NCX-10 was always running at all possible hours and reducing/removing any downtime of the machine. They also optimized the scheduling of the NCX-10 and the heat treatment by synchronizing with the upstream and downstream processes which essentially created a prioritization sequence to ensure that more critical orders/parts were processed first to be ready for subsequent operations.

The redistribution of the workload was done by introducing older machines that were able to take on less critical orders and increase throughput of the process for the NCX-10. The ovens underwent a process of optimized loading to maximize the number of items that can be processed in batch.

Assembly was improved by creating standardized procedures, a reorganization of workstations, balanced workloads to redistribute tasks, and cross train workers to increase flexibility. Inspection was improved by integrating inspection at quality check points at key stages of production rather than at the end so that defects can be caught early and corrections could be made right away.

3. What were the tenets (those that are often held on to, even in the face of contradictory evidence) that Alex and his team dismantled?
 1. Efficiency is Everything
 - a. Focusing on the bottleneck will lead to better performance for the entire system.
 2. Maximizing Utilization
 - a. If every process/step in the flow is maximally utilized then it will create excess inventory and increased lead times. Managing the flow is most important.
 3. Large Batches are more Efficient
 - a. Large batch sizes leads to an increased inventory, longer lead times and an increased complexity in scheduling. Smaller batches reduce inventory, allow for an increased response to specific customer demand and improvement in work flow.
 4. Cost Accounting Focus
 - a. Throughput accounting was used to better align the operations with the goal of making money rather than the traditional cost account metrics that rely on cost per part of machine efficiency.
 5. Running Machines Continuously
 - a. Again, this leads to over production, excess inventory and an inefficient operation.
 6. Quality Control After Production
 - a. Quality checks were implemented into the production to process and catch defects early on to reduce rework and make corrections faster.
 7. Stockpiling Inventory

- a. Stockpiling ties up capital, space and does not allow for the identification of underlying operational and production issues.
- 8. Fixed Production Schedules
 - a. A more flexible and dynamic scheduling allows for the plant to adapt to real-time changes which allow the production to be better aligned with demand and production capability.
- 9. Managers must have all the answers
 - a. Alex created a culture of teamwork and where all levels of workers were able to provide their input and solution to each problem.