



# THE GOAL

By Eliyahu Goldratt

A Book Summary from  
Virtual Done Well

## About the Author: Eliyahu M. Goldratt

The late Eliyahu Goldratt's acclaim as an author is undeniable, but all 12 of his books relate to the theories and concepts that he developed as a physicist and business guru, the most well known of which is the Theory of Constraints (TOC). It is this theory that he chose as the topic for his first book, *The Goal*, which sets out to explain TOC and its concepts in a digestible way, by taking the form of a business novel.

*The Goal*, along with a further five business novels penned by Goldratt, takes complex business and accounting topics and by incorporating them into an engaging storyline, makes them easier to take on board and understand, and helps readers to relate them to real-world business scenarios.

# THE GOAL: THE SUMMARY

## CHAPTERS 1 TO 7

Alex Rogo is the Manager of a **production plant that is neither productive nor profitable**. Alex's boss gives him **three months to improve** the plant, or to see it closed down. Alex is not the only manager with a plant under threat. It transpires that **the entire division must improve within the year** or it will be sold off. All the plant managers receive stretching objectives to achieve in the following quarter.

Alex recalls a conversation he had with his old physics professor, Jonah. During that conversation, Jonah correctly predicted that the plant would suffer from **high inventory and production delays**. Jonah had also explained that **any company has only one goal** and that **the only productive activities** are those that move the company towards it.

Alex begins to think about what the “goal” is for his plant and the company. He finally realizes that ultimately, it is to **make money**. He has a long conversation with his plant's controller, Lou, during which, the two men identify that the essential requirements are to:

- Improve cash flow
- Provide a higher return on investment
- Increase net profits

## CHAPTERS 8 TO 16

Alex speaks with Jonah, who provides him with three operational guidelines, in the form of measurements, before their conversation is cut short.

**The measurements are as follows:**

- Throughput is the rate at which the system generates money through sales
- Inventory is the money a company invests in purchasing things which it will sell
- Operational expense comprises money spent on turning inventory into throughput.

Alex sits down with his team to align on the meaning of **throughput, inventory, and operational expense** in the context of his production plant. The team's focus turns to the plant's robots, and it decides that something must be done with them, as they have not improved productivity, but reduced it.

Jonah advises Alex to drop the focus on the robots. During the same conversation, the pair discuss the concept of a **balanced plant**, which while sounding impressive, **really means a plant that is close to the point of bankruptcy**. Jonah suggests that Alex should consider how a combination of **dependent events and statistical fluctuations** might affect the plant.

While out on a hike as a scoutmaster, Alex stumbles upon the **relationship between dependent events and statistical fluctuations**. He realises that the last in a series of dependent events must make up for all fluctuations occurring throughout the sequence if the events are to average out. In practice, this rarely happens.

With his scouts, Alex uses a die, some bowls, and some matchsticks to simulate the **impact of statistical fluctuations** on a production line. The experiment reveals that **a balanced plant will experience throughput shortfalls and rising inventory levels** when it relies on dependent events and is subject to statistical fluctuations.

## CHAPTERS 17 TO 20

Alex returns to work, applying what he learned about dependent events and statistical fluctuations to the completion of a large, overdue order. During production of the order, productivity increases and Alex's coworkers are convinced that his theory is sound.

As he is unsure how to proceed, Alex has another conversation with Jonah. This time Jonah introduces Alex to the **Theory of Constraints**. The fundamental tenets of the theory are that...

- **A bottleneck** is a resource with capacity equal to or less than the demand placed upon it
- **A non-bottleneck** is a resource with capacity greater than the demand placed upon it

Jonah also advises Alex against trying to balance the plant's capacity with demand, and recommends that instead, he should focus on balancing the flow of products through the plant. Alex then sets out to **identify the bottlenecks** in his plant, and finds that they exist in the heat treatment section and at a machine called the NCX-10.

Jonah finally pays a visit to Alex's production plant. He advises Alex to focus on **increasing productivity at the bottlenecks**, and that it should be possible to do so without purchasing extra machines. Possible ways to **increase capacity** might be to...

- Eliminate downtime at the bottlenecks
- Ensure that bottleneck machines are only working on quality products
- Outsource some of the bottleneck activities

Alex takes Jonah's advice and reorganises the production sequence, applying the bottlenecks to work solely on overdue orders

## CHAPTERS 21 TO 26

Alex's team develops a tagging system to **prioritize work at the bottleneck and non-bottleneck machines** in the plant. Over time, performance at the production plant improves because of this new strategy. An old machine is then acquired and refurbished to supplement the NCX-10, further enhancing productivity.

Then a problem arises at the two bottlenecks in the plant. Workers are not on station at the bottlenecks when needed, because they are being sent to other areas of the plant to keep them busy. Alex insists that a supervisor must be at each bottleneck at all times. One of the supervisors discovers how to **mix and match an old and new process** at one of the bottlenecks, **increasing efficiency** by a further 10%.

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Jonah determines that there are no new bottlenecks. The issue relates to the prioritization of bottleneck and non-bottleneck parts on the production line. Alex and his team, along with Jonah begin to look at possible solutions, focusing mainly on the tagging system mentioned in Chapter 21.

Ralf, a computer specialist at the plant, presents an idea he has about creating a schedule for the release of bottleneck and non-bottleneck parts. This schedule will prevent any build-up of **excess inventory** in front of each step on the production line, including both the bottlenecks and the non-bottlenecks.

## CHAPTERS 27 TO 32

Alex attends a corporate meeting, where his boss tells him in private, that if he can manage to achieve a 15% performance improvement each month, his plant may escape closure. Although such an increase would require new demand from the marketplace, Alex agrees to meet the ultimatum.

In a phone call with Jonah, Alex mentions his plant's new performance targets. As a possible solution, Jonah suggests **reducing production batch sizes by half**, which should enable a 50% reduction in inventory, make the plant's response time shorter, and reduce the lead times for customer orders.

A new marketing strategy (developed to generate the new market demand to support the performance increase) nets a sizeable prospective customer, but the plant must ship 1,000 products in just two weeks to win the business. Alex's team makes a proposal to the customer: to ship 250 products per week over a period of four weeks. The customer likes the proposal, and **the plant can meet the demand if the team cuts batch sizes by a further 50%**.

The new order improves plant performance by 17%, but that is according to a new accounting method developed by Lou (the plant's controller). When using the standard accounting method used across the company, the improvement is only 12.8%, as confirmed by the division auditors. On a more positive note, the new customer, delighted with the service from Alex's plant, **increases its order** from 1,000 products, to 10,000.

Alex attends another corporate meeting related to the division's future prospects. Dissatisfied with the meeting's progress, Alex ducks out to speak with his boss directly, only to find, to his surprise, that Division has already made the decision... **Alex's plant will remain open!** Furthermore, Alex receives a promotion. **He will become the manager of all three plants in the division.** Alex calls Jonah to seek advice. Jonah declines to offer much help, but says he will be more forthcoming if Alex can answer some specific questions.

## CHAPTERS 33 TO 36

Alex assembles a new core team to help him manage the division. The team sets out to consider how the new production solutions can be rolled out to the other two plants. The task will be tough and will require **modification of the concepts** for them to work at each plant. The team decides to meet daily to **develop strategy and discuss tactics**.

As they review the processes used to solve the problems at the first plant, Alex's team comes up with a **five-step methodology** to address bottlenecks at the three plants. They name it the Process of On-Going Improvement (POOGI). The five steps in the process are as follows:

- 1) Identify bottlenecks.
- 2) Discover how to exploit the bottlenecks.
- 3) Subordinate all decisions that do not relate to Step 2.
- 4) Elevate the bottlenecks.
- 5) If a bottleneck breaks during the four previous steps, return to Step 1.

## CHAPTERS 37 TO 38

Alex and the team complete a further review of POOGI. In doing so, they discover some issues that prompt a revision, primarily to Step 5, which they amend to state that when returning to Step 1, care must be taken to prevent new bottlenecks arising because of inertia. The team also finds that bottlenecks in some plants were being kept busy by the **creation of fictitious orders**, and that by eliminating the practice, they can gain 20% production capacity.

The head of sales informs Alex of a **new prospect in Europe** whose order could fill the extra production capacity. The company will have to offer lower prices than it does for domestic customers, but the order will open up new opportunities in the European markets. Alex approaches the challenge from the perspective of a physicist, and establishes that even though prices must be cut for the European customer, incremental profit will still be forthcoming for the division.

## CHAPTERS 39 TO 40

Just when everything seems to be falling into place, problems arise at Alex's old plant. All the new orders are causing **multiple new bottlenecks**. The team analyses the problem and identifies a solution. It is agreed that the plant will **increase inventory in front of the bottleneck process-steps**.

As this solution will **increase cycle times**, the sales department will receive a mandate to promise new-order fulfillment on a four-week timescale, which is twice as long as before. While this change may not be popular with the sales department or some of the new customers, the production team determines it **to be a necessary measure to meet the new problems** head-on.

Alex and Lou spend some time pondering the questions Jonah asked the last time he and Alex spoke. In doing so, they come up with some questions of their own, for which the answers seem crucial to effective management. Those questions are...

- What should we change?
- What should the change comprise?
- How can we bring about the change?

At the same time, Alex realises he must stop relying on Jonah for answers and that instead, he must become adept at **analysing complex problems** and solving them without creating new ones.



## SUMMARY CONCLUSION

In its novel guise, The Goal introduces and explains some fundamental principles and theories relevant to any company wishing to achieve continuous improvement, namely:

- The three critical operational measurements: throughput, inventory, and operational expense
- The theory of constraints
- The relationship between dependent events and statistical fluctuations
- The Process of Ongoing Improvement (POOGI)

Finally, it is worth noting that, while not mentioned in this summary (for the sake of brevity), a side-story runs throughout the novel. It focuses on how pressures at work affect Alex's life at home, placing great strain on his marriage, and how like the situation at the plant, he is ultimately able to fix the problems and hopefully, ensure a happy future.

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