



## The Goal: A Process of Ongoing Improvement

*Eliyahu M. Goldratt*

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## **The Goal: A Process of Ongoing Improvement** Eliyahu M. Goldratt

Written in a fast-paced thriller style, 'The Goal' contains a serious message for all managers in industry and explains the ideas which underline the Theory of Constraints developed by the author.

### **The Goal: A Process of Ongoing Improvement Details**

Date : Published June 1st 2012 by North River Press (first published 1984)

ISBN : 9780884271956

Author : Eliyahu M. Goldratt

Format : Paperback 362 pages

Genre : Business, Nonfiction, Management, Leadership, Self Help, Buisness, Personal Development, Productivity, Economics, Entrepreneurship



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## From Reader Review The Goal: A Process of Ongoing Improvement for online ebook

### Simon Eskildsen says

This is to Systems Thinking what The Five Dysfunctions is to management: A peachy piece of fiction, packed with applicable lessons in the most enjoyable format you can imagine. While other systems thinking books are somewhat dry, this one is filled with life, even romance, and well-grounded in reality. While five stars normally for me would mean 'life-changing,' in this case I can't resist because of a rare and wonderful balance between enjoyment, levity, and insight. This type of book, to me, is way better than crime fiction or fantasy. I wish business fiction was a genre with endless options.

In The Goal, a dysfunctional manufacturing plant is transformed after the protagonist has a chance encounter with his physics professor in an airport lounge. Through an unlikely rekindling of the relationship, the professor shows him simple systems thinking principles that are gradually incorporated at the plant. These principles completely transform the site. Through continued improvement, it turns traditional accounting and productivity practices upside down and soon outperforms all other plants in its industry.

If you're bought into the whole idea of learning to think in mental models, as Dalio describes in Principles or Munger in his Almanack, you'll love this book to see how it's applied in action. If not, perhaps this story will show you the usefulness of it in an entertaining, light-hearted fashion. The book will give you some hope that a hopeless situation can be turned around with a little ingenuity.

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### Pedro says

This is a business book, telling the story of a factory manager, and eliminating bottlenecks, and ultimately helping to make money for your company. I liked the story approach of this book (as, lets be honest, so many business books are boring). No, you shouldn't read it for literature sake. Yes, it will give you some ideas on helping to achieve The Goal.

One quick side-note: the audiobook is great, since it has other voices for different characters, background sounds (for when they're walking around the plant/factory), and nice touches like that. Very well done.

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### Ameera Hegazy says

It is a Fantastic book, full of wisdom and knowledge. For all Industrial Engineers and those who are interested in management trust me and read it :)

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### Maree says

I did a bad thing and didn't realize that this was a library book that was supposed to be sent along to them six months ago...so I read it in a weekend and dropped it off on Monday.

It's a good example tale of a problematic plant and how the manager turned it around using what were then different measurements of success (which are now much more standard today). It was mentioned in one of my business classes as a good story example of changing and coming to conclusions about what's working and what's not in a plant environment. It's a really easy read, simple to follow, and maybe at times a little complexity would have been welcome.

I wouldn't call this book well-written by any stretch, but using it in place of a business textbook would be solid as it at least has a story of interest to follow. Though the wife subplot was pretty unnecessary and not well done in my mind.

Overall, a very basic storied example of business concepts put into action.

## **Noble Aide says**

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## Otis Chandler says

Great explanation of the theory of constraints and operations management. It's a business classic- first published in 1984 - but still relevant as it gets at the fundamentals. I almost removed a star for trying to create a fictional story to tell the book in that was badly told/edited. Did we really need the side story about the protagonists marital issues?

One of the biggest takeaways from this book is that it's incredibly important to set the right goals to manage a complex operation. This sounds obvious and intuitive, however it's actually much harder than most people think, and easy to get wrong. It gets down to the question of: is everyone working on the "right things". The things that will lead to the business making the most money. It's too easy to find a things that are easily measurable and saying "this thing is correlated with our success, so let's focus on it". It sounds like "cost accounting" fit into that bucket.

"What you're saying is that making an employee work and profiting from that work are two different things."

So how do you set the right goals? Focus on making money!

"So this is the goal: To make money by increasing net profit, while simultaneously increasing return on investment, and simultaneously increasing cash flow."

One of the drivers of making money in any business that creates a product is throughput, or how fast a product can be made. The others are costs/operating expenses, and inventory. One of the key concepts of the book is that focusing on throughput rather than costs will yield much better results.

"The entire bottleneck concept is not geared to decrease operating expense, it's focused on increasing throughput."

The bottleneck theory, or the theory of constraints, was very useful to think about. My company produces software and not physical products, but each feature we develop definitely has steps it has to go through: creating the concept, research, spec, design, implementation (backend and client), testing, QA, measure results, analyze them, iterate, etc. Focusing on where the bottlenecks are with that process can help us move faster. And every startup needs to be moving fast - and not just at building - we need to be doing build, measure, learn as fast as we can.

A consequence of the bottleneck theory that is useful to keep in mind is that in any system only the bottlenecks should be 100% utilized. Every manager will have a natural tendency to want to utilize all their resources to 100% because that just seems... wasteful if you don't. People should be working full time right? But a system can only run at the speed of the slowest bottleneck, so non-bottlenecks will by definition have spare cycles, and it's important to keep them open for the important work and not fill it up with unimportant stuff that will bog them down when you actually need them on the important stuff.

I've seen this happen many times in software. An engineer finishes a project, and the big important project coming from the design team isn't done yet, so he picks up something small in the meantime. The next day that big important project is ready to go, but the engineer only needs "one more day" to finish this thing he started. And then that day becomes two and then three (because we didn't count QA). And then we've lost 3 days on our most important project for another project that doesn't matter at all. Add that up across a large number of developers, and you've lost a lot of time.

The theory of constraints is not limited to manufacturing, as the author shows. In the end, he is advocating it as a method or process of learning.

- STEP 1. Identify the system's bottlenecks.
- STEP 2. Decide how to exploit the bottlenecks.
- STEP 3. Subordinate everything else to the above decision.
- STEP 4. Elevate the system's bottlenecks.
- STEP 5. If, in a previous step, a bottleneck has been broken go back to step 1.

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## **Jan-Maat says**

It is hard for me to find the right tone to review this book, perhaps I'll open by saying that of all the business books I've read this remains the most approachable, and possibly also the best value for money once the case studies in the interview with the author at the end of the book are taken into account.

Really it is built around a very simple insight - that the speed of a convoy is determined by the slowest ship, what the book does is demonstrate the effect of consistently applying this insight to the workings of a business.

This is the basis of Goldratt's theory of constraints. On the whole human life exists within the triple constraints of time, cost and quality (view spoiler). For example if a house is built quickly at low cost the quality will be low, if you want a high quality house built quickly you have to be prepared to pay for it, or compromise on the time it will take. Goldratt has the idea of focusing on a constraint and redesigning the business around it.

*The Goal* is a novel, a groanworthy and terrible and didactic novel, a combination which makes it a success because it doesn't take itself entirely seriously (view spoiler). I cannot recommend reading this book highly enough as an opener to thinking about the flow of work through organisations, how organisations succeed or become dysfunctional. It's intended as a gentle introduction to the Theory of Constraints, but also opens the door to systems thinking. Editions with the extra interviews with how different businesses have applied Theory of Constraints are particularly enlightening and worth getting hold of.

The one message of the book that I found especially interesting was that eventually the greatest constraint on the fictional business in the novel is not its potential productivity but the capacity of the market to absorb its products. What I find interesting is that this is a message about the limits of the market in a business book. Maybe the boosters are correct and the ability of capitalism to invent products is near unlimited, maybe potential economic expansion could be extremely great however all that is irrelevant. The determining factor will be the size of the market. Or the inventiveness of advertisers to persuade us to want more junk.

There is a sequel: It's Not Luck which I don't find as successful a novel, partly because it is less groan-inducing and more worthy in tone but also because it doesn't go through the steps of the characters problem solving efforts in the same level of detail.

I suppose one reason why I am enthusiastic about *The Goal* is the part it plays in my thinking about the Industrial Revolution. There was nothing new in principle about the technologies of steam power, what changed was the ability of the market to consume - producing more is a high road to insolvency unless you can find the customers to buy your product. There maybe is the key, the world of *The Goal*, like our own, operates in a particular historical and sociological context, rather than a fantasy in which economic growth "to infinity and beyond", in the immortal words of Buzz Lightyear, is the solid basis in which all assumptions are rooted.

An example of the realism of the thinking (view spoiler) in *The Goal* is that at one point the protagonist is faced with the possibility of a price war - competing with other manufacturers on the basis of price alone - but this is something that he doesn't want to do. By contrast I notice from time to time the adverts for a UK furniture store which promise the purchaser that they will have nothing to pay for a year, four years free credit, or even both. A market strategy predicated on a loving relationship with their funders. Then again it strikes me from time to time just how fantastical real life is.

On the other hand there's a more basic reason why I like it. I was never any good at Maths in school and so it was from this book that I learnt that when looking at figures if the answer looks wrong, what you need to do is think about the assumptions rather than just check the calculation. It is impressive where adding up the wrong figures in the right way will get you, individually or as a society.

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### **Bjoern Rochel says**

2nd read-through: I still love this book. Primarily because of its collaborative solution finding process and its vocalness against local optima. Also from a didactic perspective I think this is something we (as people leading teams) should strive for: Enabling peers to make better decisions by themselves via good process.

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The references in "The Phoenix Project" pushed me towards reading this one as well. I really enjoyed listening to the audible version of this book and I would also argue that there's a lot to take from this book, even if you've already read "The Phoenix Project".

In a world where so many people are talking about scaling Agile, this is one of the books that gave me a lot more insights in the underlying principles of lean. The last chapters are especially great ammunition for folks that have to deal with By-The-Book advocates of certain methodologies. Separating the application of a

principle (together with the assumptions) from the principle itself is a great way towards more insight and a more meaningful implementation of whatever methodology in the context of your environment/company.

Next stop is "Beyond the Goal"

P.S.: Started to listen to "Beyond the Goal" and realized that Jonah (from the audible version) sounds exactly like Goldratt himself. Coincidence? I think not :-)

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### **Nathaniel says**

The best process improvement novel I've seen, this classic work explains the all-important Theory of Constraints through real life examples and a surprisingly good story. Most books of this nature are exceptionally unrealistic, but this one manages to keep the reader engaged, which is key for an instructional text like this.

The book's lessons have some practicality in normal, everyday life, but its greatest utility is for those involved in process improvement in industries such as manufacturing, distribution, services, and retail. All industrial and systems engineers need to read this book, as do all managers of processes.

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### **Jens Mayer says**

At first, I was not sure if this book is my cup of tea, and I got a bit tired of the "here's your all knowing mentor approach" every other author seems to take, maybe reading too many business novels in a row. Nevertheless, Goldratt's Theory of Constraints is one of the most important concepts to grasp if you're thinking about managing flow and throughput in goal oriented production systems. Although this story is set within a manufacturing environment, its vocabulary can be easily abstracted to todays IT organisations. Rest assured: Reading this piece and looking at how Kanban is frequently implemented might give you some eye-opening moments...

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### **Lance Greenfield says**

This is THE book that will improve your business

I have lost count of the number of people to whom I have recommended this book. Whatever area of management you find yourself in, and at every level from business studies student to CEO and CFO, you are bound to pick up something useful from "The Goal."

The story follows the complex life of Alex Rogo as he works at one problem after another. With the help of his old friend, Jonah, he identifies and solves problem after problem, on the road to saving his manufacturing plant, his own job and those of his colleagues, and his marriage. Each problem is broken down into its simplest components so that the real priorities are easily identified and dealt with.

Satisfying the senior management of his company and the accountants that he has turned around the fortunes of his plant proves difficult, but he supports his arguments with solid evidence.

Managers will recognise many of the problems that Alex encounters as, although part of this fiction, they belong to the real world rather than the theoretical text books that they may be used to reading. The story is far from dull and is easy to read and to understand.

What particularly appealed to me, as a practitioner of process modelling and simulation, was the way that these techniques were used to bring about significant business improvements. The power and value of such techniques was ably demonstrated and should encourage many more companies to put them into practice.

Eli Goldratt has succeeded where many have failed, to put these concepts into language that everyone can understand and therefore benefit.

The only negative comment that I have about this book is that I felt that the background story became a little bit tedious towards the end, but the value gained from reading the rest far out-weighed this minor moan.

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## **Imran says**

### **NOTES**

Productivity: to accomplish something in terms of a goal

“The future of our business depends upon our ability to increase productivity”. -Peach

What is the Goal?

Original thoughts

Increase productivity

Produce products

Power

Market share / Sales

Cost-effective purchasing

Supplying jobs

Quality

Quality & Efficiency

Technology / R&D

Communications

Customer satisfaction

Make Money

Three measurements essential to knowing whether company is making money

Net Profit

ROI

Cash flow

Make money by increasing net profit, while simultaneously increasing ROI, and simultaneously increasing cash flow

But he realizes that at the plant level these measurements don't mean much. Only at the top level.

More than one way to express the Goal - at the plant level

Throughput - the rate at which the system generates money through sales (not production. if you produce something, but don't sell it, it's not throughput)

Inventory - All the money that the system has invested in purchasing things which it intends to sell

Operational expense - all the money the system spends in order to turn inventory into throughput

Questions to ask when adding a robot

Did we sell any more products as a result?

Did we reduce number of people on payroll?

Did inventory levels go down?

Goal: Increase throughput while simultaneously reducing both inventory and operating expense.

“Money”

Throughput is the money coming in

Inventory is the money currently inside the system

Operational expense is the money we have to pay out to make throughput happen

In manufacturing: An event, or a series of events, must take place before another can begin... the subsequent event depends upon the ones prior to it. The important thing occurs when dependent events are in combination with another phenomenon called statistical fluctuations

Boy Scout hike

The leader of the troop controls the pace of the line. If a gap forms and the line is lengthened all you can do is shorten it up to the distance of the person ahead of you - dependent events!

Dependency limits the opportunities for higher fluctuations

\*\*\*Whoever is moving the slowest in the troop is the one who will govern throughput

Two types of resources

Bottleneck resource - Any resource whose capacity is equal to or less than the demand placed upon it

Non-bottleneck resource - Any resource whose capacity is greater than the demand placed on it

Bottlenecks

Do not balance capacity with demand, balance the flow of product through the plant with the demand from the market.

To increase the capacity of the plant is to increase the capacity of only the bottlenecks

Two principal themes on which you need to concentrate

Make sure the bottlenecks' time is not wasted

...

Visual management in smooth work on manufacturing floor

Using the bottlenecks to predict when the next order will be shipped

There cannot be any idle time for bottleneck processes. Dedicate people full-time to those processes.

To shorten lead time, spend the idle time while a machine is working, to set up for the next batch

Theory of Constraints

The level of utilization of a non-bottleneck is not determined by its own potential, but by some other constraint in the system

Activating a resource and utilizing a resource are not synonymous

Cutting the batch size in half - result in half wip

The time a material spends in each stage from entry to being shipped out

Setup - the time the part spends waiting for a resource, while the resource is preparing itself to work on the part

Process time - the amount of time the part spends being modified into a new, more valuable form

Queue time - the time the part spends in line for a resource while the resource is busy working on something else ahead of it

Wait time - the time the part waits, not for a resource, but for another part so they can be assembled together

Common practice can mask common sense

Capacity Constraint Resources - CCR -

Management Techniques

Process of on-going improvement

Step 1: ID the system's bottlenecks. (After all it wasn't too difficult to identify the oven and the NCX10 as the bottlenecks of the plant.)

Step 2: Decide how to exploit the bottlenecks. (That was fun. Realizing that those machines should not take a lunch break, etc.)

Step 3: Subordinate everything else to the above decision. (Making sure that everything marches to the tune of the constraints. The red and green tags.)

Step 4: Elevate the system's bottlenecks. (Bringing back the old Zmegma, switching back to old, less "effective" routings...)

Step 5: If, in a previous step, a bottleneck has been broken go back to step 1.

CCR

IDENTIFY the system's constraint(s)

Decide how to EXPLOIT the system's constraint(s)

SUBORDINATE everything else to the above decision

ELEVATE the system's constraint(s)

WARNING!!!! If in the previous steps a constraint has been broken, go back to step 1, but do not allow INERTIA to cause a system's constraint

Root Cause

What to Change?

What to Change to?

How to Cause the Change

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## Darcy says

Goldratt introduces the Theory of Constraints via this entertaining novel. I think this book is excellent if you are new to Operations. And I think the approach of telling a story rather reading a traditional text book is a good format.

It demonstrates why many traditional measurements and common intuition is wrong. The book revisits what the goal of a business should be and what is important to measure and control to achieve that goal. Through examples in the main character's personal life and work life, Goldratt explains the weaknesses of traditional cost accounting systems and what's important to track. In short, to optimize money earned, increase throughput, decrease operating expense and decrease inventory. And an important corollary is that any change requires impact to all 3 (throughput, operating expense and inventory). It is a fallacy that a change can impact only one of these metrics.

A good follow on book to this novel is Synchronous Manufacturing: Principles for World Class Excellence by Umble and Srikanth.

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## Brian says

[after Alex is promoted to division head and can't optimize a single plant, but needs

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### **Sergey Shishkin says**

This book is fantastic. Not only does it introduce the Theory of Constraints, but does it so as if ToC was invented by the main characters themselves: Revealing the reasoning behind the theory, unfolding each step in a logical progression, highlighting the pitfalls and finally crystallizing the method.

Truly genius.

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