NEVER SAY I KNOW
Project Management, Part 1
Identifying the Giant

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Dr. Goldratt, we know everything there is to know about PM. Nevertheless, to determine how long a project will take, our standard practice is “multiply x 4 and pray.”

Our problem is that OUR PRAYERS ARE NOT ACCEPTED.

We read THE GOAL. It is not the solution for our project management environment, but we are convinced if anybody can figure it out, it’s probably you.
I am an expert in production, not project management!

Here, take these 2 booklets – they contain everything we know about project management.
What they knew

- The key for projects was the lead time
- The lead time was determined by the critical path
- In a typical project of 40,000 tasks, the critical path was only 40 tasks!
Eli found company in his quest for FOCUS
In a different field
On a much more massive scale

Don’t look on 100 types of resources, look on only 1 – the bottleneck!

Focus on 1%

Don’t look on 40,000 tasks, look on only 40 – the critical path!

Focus on 0.1%
I’ve been thinking too narrowly! Statoil is giving me exactly the same material, only more profound. Whether in projects or production, it’s CONSTRAINTS we’re dealing with!

In Production…
- Constraint is capacity-based
- It’s the Bottleneck

In Projects…
- Constraint is time-based
- It’s the Critical Path

2 weeks later, everything was changed from OPT to Theory of Constraints.

...and Eli was off to Oslo
Critical Path provides project companies with a fantastic ability to focus. Nevertheless, they are late even when they “multiply x 4 and pray”!

These are not stupid people – and Statoil in particular is the best in the world at projects! Their estimates must be, on average, good enough – how could it be that multiplying x such a large factor still does not provide enough time?

There must be a fundamental assumption that is missed, which is devouring the time. Think…

The duration of a project is the sum of the duration of the tasks along its critical path. The actual duration of any task varies – often quite significantly – from the estimate. When a task on the critical path takes longer than its estimate, the whole project takes longer. When a task on the critical path takes less time than its estimate, the project should take shorter. But that is apparently not happening! Why?

By the time he reached Oslo, Eli had the answer.
There are dependencies and variables.

Task time estimate = task time commitment, explains why only delays accumulate.

Solution

Aggregator the safety in project and feeding buffers (eliminate the safety per task).

Task time estimate ≠ task time commitment.
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<th>On the Shoulders of Critical Path</th>
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<td>1. Critical Path</td>
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<td>2. Enormity of unaffected area</td>
<td>2. All projects</td>
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<td>3. Getting on the giant’s shoulders</td>
<td>3. Critical Path defines the project duration and provides the ability to focus on the few elements that make the real difference in the project’s lead time.</td>
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<td>4. Conceptual difference</td>
<td>4. The time estimate for each task is taken as a commitment, leading to elongated estimates, and the inability to gain time when tasks less time than estimated.</td>
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<td>5. Wrong assumption</td>
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<td>6. Full analysis</td>
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But wait a minute!

Where is bad multitasking?
For this, we must wait 5 years, to 1991
Saddam Hussein launches missiles on Israel during Gulf War

Israel, our dear friends, please don’t retaliate. Take these F-16s instead...They just need a little bit of work...

- The backbone of the Israeli Air Force
- Israel is a small country with limited budget
- Limited budget meant limited maintenance resources
Eli leads the analysis of the lead time

On average, ~14 months from first file opened till last file closed

Plane arrives

By the book?

Open files

Super Engineer

Detail Procedures

Conduct Repair

Inspect, Finalize, Close File

Flight ready

~50
The problem became so big that it limited the number of airplanes the depot was working on. That put a cap on the increase in lead time.

Lead time to close a problem increases.

more & more bad multi-tasking occurs.

Each engineer has more & more open problems.

There is a constant stream of problems.

The same day a problem is identified, it is assigned to an engineer.

The vicious cycle
The head of base realized this was the key and immediately implemented the following:

- We will allow only 3 open files per Super Engineer, assigning a new one only when 1 of the 3 is finished.
- Duration from opening the first file to closing the last file went from 14 months to 7 weeks.
- Overtime was nearly eliminated, no more engineers were added to accomplish it.
Critical Chain, circa 1992

- Stop planning as if what is uncertain is known.
- Aggregate the uncertainty!

- Stop bad multitasking
  - Focus – one task at a time.
- Freeze!

1997
Combining the two elements of Aggregation and Freeze during CCPM software development led to the 3 colors priority management system.

Elbit Systems implementing CCPM in their multi-project environment led to inventing the “virtual drum” which led to non-publication of Project Management the TOC Way.

Projects S&T introduced 2008, verbalizing the full logic of CCPM and its implementation.
The Projects S&T

Harmony reader available for free download at www.goldrattresearchlabs.com
## Inside Each S&T Step

| Necessary Assumption (NA)      | The “Why” of the Step. The reason that the higher level S&T step cannot be implemented unless a change is made. In other words, it describes the necessity for an action to be taken. (NA is not in highest level of the S&T)  
  | **Why is what I’m responsible for really needed by the organization to improve vis-à-vis its goal?** |
|-----------------------------|---------------------------------------------------------------------------------------------------|
| Strategy (S)                | The “What” of the Step. The objective – the intended outcome – of the S&T step. When the strategy is achieved, the need highlighted by the necessary assumption is met.  
  | **What am I/are we responsible for accomplishing?** |
| Parallel Assumptions (PA)   | The “Why” of the Tactic. The conditions which exist in reality leading us to a specific course of action that would achieve the strategy; forms the logical connection between the tactic and the strategy, explaining why the tactic is the course of action that leads to the attainment of the strategy.  
  | **Why will the action/activity (tactic) achieve the strategy?** |
| Tactic (T)                  | The “How” of the Step. What needs to be done in order to achieve the strategy. In a well written S&T step, the tactic is obvious once the parallel assumptions are read.  
  | **What must I/we do to accomplish the strategy?** |
| Sufficiency Assumption (SA) | The “Why” of the next level. Explains the need to provide another level of detail to the step. If we don’t pay attention to it, the likelihood of taking the right actions is significantly diminished. (SA is not in lowest level of the S&T)  
  | **Why is accomplishing this at risk without providing another level of detail for my subordinates?** |
Relationships of S&T Steps & Levels
Small Groups

Study the key concepts of the CCPM Solution in the Projects S&T

- Notice how they are verbalized
- Notice where they are located

Aggregation of Uncertainty
Bad Multitasking

3 Colors Priority System
Virtual Drum