

# Critical Chain as a Management Technique

By Fred Manzer

The art and science of management fascinates me. I love watching the latest “flavor of the month” gain acceptance as the long awaited solution to all problems and then as it falls out of favor and reality returns. My discovery over the years is: every idea has benefit; but most of them are not really new. Each idea spurs re-examination of what we know and encourages us to continuous improvement in our thinking and practices.

I find the same true with the Critical Chain concept. Critical chain puts a name on and formalizes some important schedule and project management concepts through some new thinking on old problems, but it does not provide a unique solution that replaces all that came before. Eli Goldratt defined critical chain. He did an excellent job of showing how to apply the concepts and we are all indebted to him for his efforts and imaginative thinking. I will refer to the concept as “critical chain thinking” to describe the application of the concepts as part of an overall project management process.

One of my customers, who did not practice any rigorous scheduling practices, asked my opinion on using critical chain rather than critical path as their primary methodology. This article looks at the basis of my response to that question. I think we can best understand critical chain thinking with a walk through the project planning process and an examination of how critical chain thinking fits in. I suggest to clients that developing a basic project plan consists of six steps:

1. The customer/sponsor identifies a need – product, result, or objective.
2. The project team develops a definition of the pieces that will combine to the project objective – a Work Breakdown Structure
3. The project team identifies the work necessary to reach the objectives captured in the WBS – schedule activities or tasks
4. The team puts the activities in their order

of occurrence – creates a network.

5. The team identifies the time to complete each activity – task durations

6. The team estimates the resources required to accomplish each activity and adjusts the durations as appropriate – resource the schedule

At this point we have “a plan” that defines an approach to accomplish the work. Unfortunately, this plan often does not meet the customer/sponsor requirements for cost and schedule and we have not even considered risk yet! The addition of risk considerations normally adds time and resources for those things we think will go wrong and the problem with meeting customer/sponsor desires becomes even worse.

This is where critical chain thinking enters in. Critical chain thinking recognizes that risk is a normal part of project life. Critical chain’s power lies in the recognition that everyone on the project attempts to account for risk and incorporates both time and cost in their duration and resource estimates for things they cannot control. By applying critical chain thinking a team examines the plan and differentiates between that which is required to accomplish the work and the fear / reserves / caution – hidden – in the plan. Identifying and removing these “hidden” reserves can shorten the time and cost by huge amounts, as much as 50-75% of the estimate. I was shocked when I began applying this process and discovered that in many cases the reserve people allow for themselves exceeds the amount of time it takes to do the work.

If this sounds too good to be true, IT IS! This tremendous savings comes at a very high price. To make the process work requires three practices that most organizations find unacceptable:

First - Estimate the duration to complete an effort, not the date. Each predecessor to an activity needs to define the exit criteria that determine when it is ready to be used. An activity does not start until all predecessors success-

fully complete. People pad their schedules because they expect those ahead of them to be late or to unsatisfactorily complete their tasks.

Second - Multi-tasking breeds failure. Most people significantly pad their schedules because they anticipate many interruptions, special requests and other interruptions that slow progress on any individual task. Bosses continually assign additional things that must also be done on a short schedule.

Third - Deviation from plan must be acceptable. When no variance from plan (late or overrun) is acceptable then people add as much reserve as necessary to avoid negative attention from management.

Your question at this point is: “With all this reserve why doesn’t anything finish early?” Simply, if people finished early then the next time everyone would remember and cut their estimates based on past performance. Additionally, if the predecessors all finish on plan and I have extra time then I usually have other tasks that are in trouble and I do not start this one until it becomes a priority rather than getting it done early.

So how do we make it all work? The key to successful implementation is in changing the way we look at project performance. We need to hold people accountable for their effort and accept risk as a valid reason for not completing on plan. In doing this we create “buffer tasks” that contain the risk allowance and expect these buffers will be consumed through the things that happen during the project beyond the control of the individual.

Individuals no longer work against dates, but against targeted durations with defined (risk list) expectations of not completing on plan. Interesting – this ties back to the Deming theory about not holding people accountable for things they do not control! Thus, to ensure that “failure is not an option” we must accept deviation as a norm.

Final BIG PROBLEM! If we actually identify  
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happen: First, people will know we might not succeed as planned. Second, some administrator will take the money (and time) to fund a budget reduction.

I have encountered a number of people who want to know if they should use critical chain or critical path like it is either one or the other. It is not either/or, but together that they work. Critical path provides a proven means to capture the workflow necessary to accomplish a project and identify where the schedule risk exists. Critical chain completes this process by providing a methodology for resolving many of the problems identified by the critical path process. It also provides a reasonable means to incorporate risk in the schedule.

So, in summary, critical chain thinking is the process of examining a critical path schedule to remove hidden risk from the network and putting it back in as identified buffers that allow individuals to deviate from their plans without risking project success. These simple steps, however, can create major changes in organizational culture and threaten management processes. Oh well, anything too easy to get is probably not worth having anyway!

#### **About the Author**

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Mr. Manzer is a Senior Program Manager with CSM, in Herndon, Virginia where he trains and consults with commercial and government

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Previously he spent six years at the Defense Systems Management College as an instructor and department chair teaching program management, earned value management, and cost estimating related courses and consulting for DoD and civilian agencies.

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