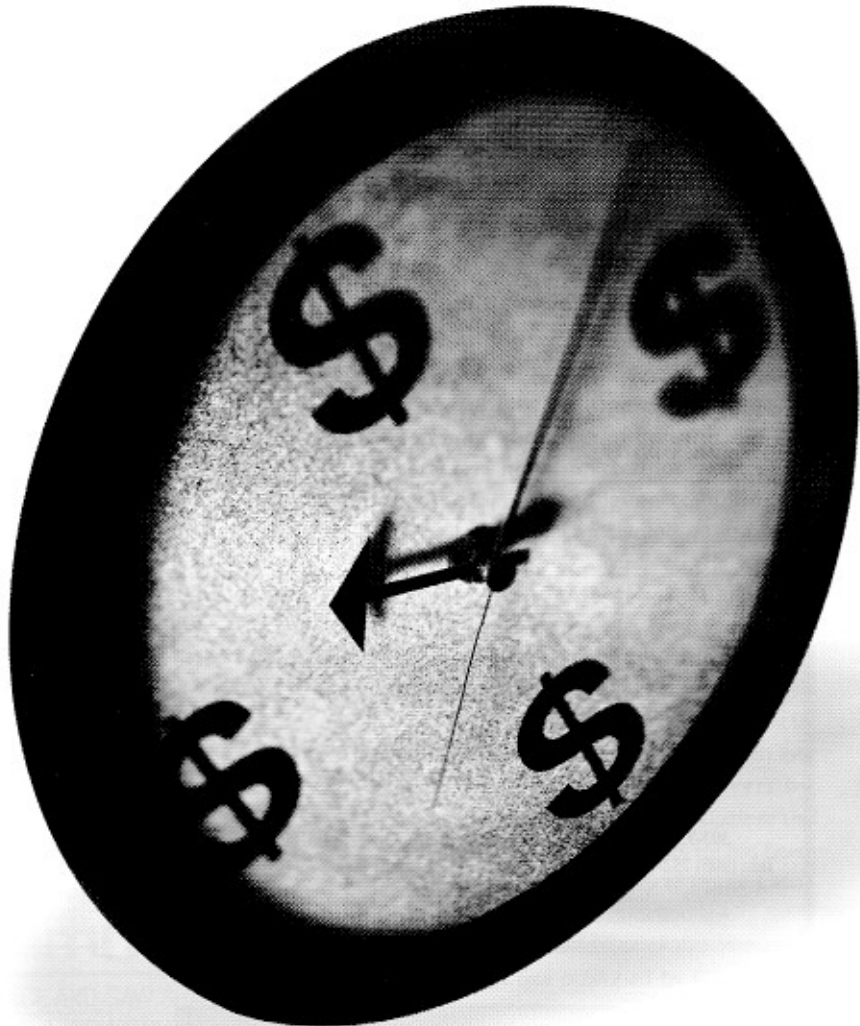


It's never easy!

Uncertainty, Buffers and On Time Completion

By Bud Brown, McR Group



Almost every project should be completed on time, within budget, and as described. Yet this is not so.

Why is that?

MATERIALS ARRIVE LATE or they are wrong or they are damaged. Sub trades show up at job sites late or with too few workers. Blueprints are flawed or lack essential details or approvals. Customers delay decisions until the last minute but still expect the project to be completed on time. To top it off, the general contractor must decide which projects to steal staff from so they can deal with the crisis of the day. The uncertainty of each of these situations affects the on time completion of the projects.

The result is that projects finish late. The alternative is to finish on time but with cost overruns or by compromising the final result. In the worst cases all three things happen. The project finishes late, over budget and with compromises. At the very least one of those three conditions exists.

The core of the problem seems to be based on the way that uncertainty is managed. All of the problems described above not only cause, but are caused by, uncertainty. Materials suppliers have uncertainty about the quality of raw materials, machine breakdowns and labour disruptions.

Sub trades can never be certain how many of the jobs that they have bid on will actually be awarded to them. If they succeed with too many bids, it can result in not having sufficient resources to meet all commitments. Architects and engineers have the uncertainty of all of the subs plus the concern of not having correct information.

If the core of the problem is how the uncertainty is managed, then how can the problem be fixed? Let us first take a look at how uncertainty is managed right now.

One way that people manage the uncertainty of projects is to build a buffer into the estimates of the time it will take to do their part of the project. If you believe that you do not build a buffer into your estimates, ask yourself if you have even a 50% chance of not meeting your deadlines. In fact, every experienced person who works with projects builds a buffer into their estimates because they know that uncertainty exists and it would be foolish not to make some allowance for that fact. That means that every supplier, designer, sub trade and yes, even project manager, is building a buffer into his estimates.

With all of that a buffer, you would think that there is plenty of protection against uncertainty. Almost every project should be completed on time, within budget, and as described. Yet this is not so. Why is that?

Partly it is because the buffers are wasted. The first way they are wasted is that work tends to expand to the available time. A worker (knowing that things can go wrong) fights for enough time to allow for the possibility of problems. If no problems occur, he knows that if he finishes early, the next time he will have a harder fight to include a margin for error. So he stretches the work out to make the time needed match more closely with his estimate. This is such a regular phenomenon that it has been given a name: Parkinson's Law.

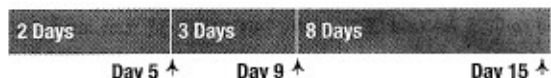
The second way buffers are wasted is through bad multi-tasking. These days, everyone has more than one job they are responsible for. Everyone wants you to work on their job right away. In an effort to keep everyone happy, people try to do a little bit of each job every day. This is ineffective in a couple of ways:

- First, doing three jobs at once won't cause the third job to get done any faster but will delay completion of the first and second jobs.
- Stopping and restarting jobs partway through causes a little bit of extra "set-up" for each change. This just adds to the total time for completion without adding any real benefit.

The third way that buffers are wasted is through the "Student Syndrome". It is called this because most of us remember school when our teachers would say "there will be a test on Friday." We would all complain that we couldn't be ready by then. But if the teacher relented and moved the test to Monday, when did we start studying? Sunday night.

When people in projects have multiple jobs they are responsible for, it is tempting to look at the job that still has a buffer as something they can set aside for a day or two in favor of more urgent demands. This becomes a problem because problems can't strike until you actually start a job. If your buffer has been used up (even partially) when you start, there no longer is any buffer.

We saw before that part of the problem is that buffers are wasted. The other part of the problem is that schedules are deadline driven. Task "A" must be completed in four days. Task "B" starts on day 5 and continues for 3 days. Task "C" starts on Day 9 and runs for eight days, and so on.

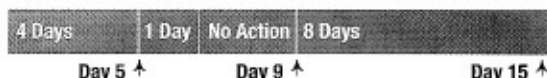


If either task "A" or "B" in the above example experiences no problems and therefore finishes early, it doesn't matter - because even with excellent scheduling, when there are multiple demands on resources the resources needed to complete task "C" won't be available

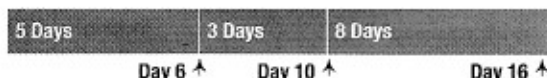
until Day 9. What this means is that delays are passed on, efficiencies are not.



or



but



The good news is that a possible solution to this problem is built in to the way that scheduling is currently done.

The buffer can be moved in the schedule to the end of the project and be made available where ever it is needed within the project. This change would require us to change from a due date driven schedule to a continuous chain of events type of scheduling.



If Task "A" takes all four days that were asked for, it eats into the buffer by two days but Tasks "B" and "C" will be scheduled to start as soon as it is done. If all three tasks have the potential problems they allowed for, the project still will finish on time. The buffer doesn't get wasted because it wasn't made available until it was needed and the efficiencies get passed on because the start dates are scheduled based on progress of individual stages

The details of how this can be made to work on a construction project would take more space to describe than we have in a magazine article. We will have that time at a workshop during the construction symposium this spring. In the meantime, if you can't wait for that workshop, consider reading the book "Critical Chain" by Dr. Eliyahu Goldratt. Or contact us for a one-on-one meeting to explain in more detail.



Bud Brown's company, McR Group, helps companies to improve effective use of their existing resources. Bud has been providing leadership training for members of the OGCA at various levels since 2004. Bud can be reached at his office (519) 501 3286 or you can visit the McR Group website at www.mcrgroup.net