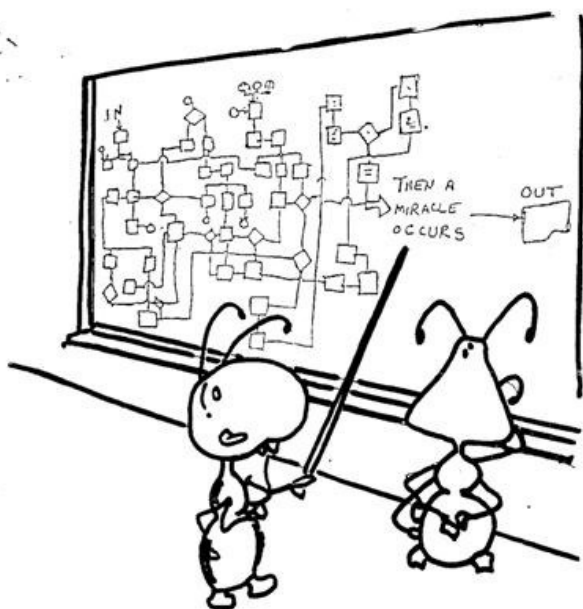


Problems with scheduling practice



"Good workbut I think we need just a little more detail right here!"

This article will briefly look at the three major problem areas affecting scheduling practice:

- The first is most organisations and managers simply choose to ignore the project schedule, in part because they have never worked with a good schedule produced and maintained by an effective scheduler¹ (they don't know what they are missing) and in part because of lax governance from the executive levels allowing the bad practice.
- The second is the inverse of the first – managers and lawyers failing to understand the purpose and limitations of scheduling and setting unrealistic expectations.
- The third is schedulers who know how to develop massively complicated files in various software tools, but have no idea what purpose and limitations of scheduling should be.

I will briefly look at each of these issues below.

Managers ignore scheduling and project controls.

This is a combination of ignorance and bad experience. The only real solution is to fix the other two issues. One of the symptoms of this problem and a major destroyer of value is the approach adopted by many managers of setting ridiculously short timeframes for projects 'to put pressure on the team to perform' (without the benefit of a schedule analysis). The consequences are inevitably reduced scope and quality and increased costs resulting in massive reductions in value.

Managers and lawyers setting unreal expectations on the process.

The schedule is a model of what may happen in the future; it is not a statement of what will occur. A good schedule is based on a sequence of activities that are reasonable and importantly agreed by the project participants as the optimum approach to accomplishing the work, based on what they know at that time the schedule is developed.

¹ The role of the planner / scheduler is subtle. During the planning phase of the project, the planner acts as a facilitator working to develop consensus within the project management team as to how the project work will be best accomplished. During the schedule development stage the 'lead technician' responsible for ensuring the schedule reflects the plan accurately, is technically correct and is agreed by the project management team.

- For more on planning see: http://www.mosaicprojects.com.au/WhitePapers/WP1039_Project_Planning.pdf

- For more on the attributes of a scheduler see: http://www.mosaicprojects.com.au/PDF/Attributes_of_a_Scheduler.pdf

Whilst it is reasonable and legally supportable to hold a contractor to a promise to complete a project within a specified time (the contract period) it is ridiculous to expect anyone to be able to determine in detail, exactly how they are going to achieve this outcome months or years in advance when many of the people who will be responsible for elements of the work are unknown. Detailed schedules for the next 2 to 4 months are a sensible way to coordinate work, using known resources who should be actively involved in developing the agreed plan (eg, the Last Planner approach). Beyond this timeframe detailed schedules are an arcane exercise that is potentially damaging - vast amounts of time and money are wasted developing the esoteric detail, then people spend even more time and money fighting over why the blind guesses entered by the planner months ago do not represent what's actually happening. There are better options, 'rolling wave' and the more sophisticated 'schedule density'² approaches work far better, but far too many managers, clients and lawyers expect schedulers to be able to perfectly forecast a 'future' involving 100s (or 1000s) of people months and years in advance. This crazily unrealistic expectation does more damage to project delivery than almost anything else!

The sole purpose of any model is to provide insight to support decision making. The project schedule is a model³; the highly complex computer algorithms used to forecast weather are a model. The weather forecasters use their expertise to interpret the models with their millions of lines of code and based on their insights, prepare short term, medium term and long term forecasts. The useful information communicated in the nightly weather forecast is a carefully structured communication of the complex information designed to allow us to make informed decisions about our actions over the next few days. Importantly, as new information becomes available the experts in the weather bureau adjust and adapt the models they use and use the new data to update their forecasts.

From the information communication perspective they manage expectations, they will tell you within an hour or so when it is likely to start raining tomorrow, they will tell you which days are likely to be wet over the next week to 10 days and provide more general information for the next few months. They do not try to forecast that it will start raining at 16:18 in the afternoon on the Wednesday in three weeks' time, even if their computer model has calculated this. They know there are too many variables in play to make this prediction viable so they say "We anticipate some rain mid-week in three weeks' time".

Schedulers are expected to produce multi-thousand line schedules that show precise dates for the start and finish of activities months and years in the future and then see their schedules attacked when the future unrolls differently. There are at least as many variables affecting the schedule as there are affecting the weather forecast!

The consequence of this demand for overly large, overly complex schedules is threefold:

- The schedule is too complex to provide useful insight to anyone, therefore cannot be used to support decision making.
- The schedule quickly becomes inaccurate and loses relevance as a working tool to help project decision making. People 'switch off' and ignore the schedule and the scheduler.
- The focus of contractual fights becomes the errors in schedule and the effect of delays on the schedule (despite the fact the actual sequence of work has very little to do with what was scheduled). This farce is continued by both sides for 'contractual advantage', rather than the focus of the project

² For more on Schedule Density see: http://www.mosaicprojects.com.au/WhitePapers/WP1016_Schedule_Density.pdf

³ Unlike 'pure models' such as weather forecasting systems, the project schedule serves a number of functions:

- It is (or should be) a decision support model used to help manage the use of time within the project;
- It is a record of agreed intent to coordinate and explain the way future work will be accomplished;
- It becomes a record of accomplishment showing how progress to date has occurred and identifying variance.



team (including the client) being on managing use of the available time proactively to finish the project on schedule⁴.

Well-developed schedules are small enough and simple enough to actually support project decision making because they are fully understood by the decision makers. Moving to this situation requires the use of ‘schedule levels⁵’ and other techniques by a skilled scheduler to provide the managers with the information they need when they need it, and to allow ‘what-if’ and options to be tested quickly and efficiently, while maintain vertical and horizontal traceability across the schedules. Think of the weather presenter and how they give you valuable information for your city or suburb, derived from some of the most complex models used anywhere.

Schedulers who don’t understand the limitations of their models.

Good schedulers know the limitations of their tools and methodologies and work within these limitations to develop useful information for management. Bad schedulers know how to run their software and enter data and then believe the information produced is correct.

The schedule is a model and as the statistician, Professor George E. P. Box (University of Wisconsin), stated a few years ago “**All models are wrong, some are useful⁶.**” He also stated:

- “Since all models are wrong the scientist cannot obtain a "correct" one by excessive elaboration⁷.” (neither can the planner!); and
- “Remember that all models are wrong; the practical question is how wrong do they have to be to not be useful.”

The paradox is, once you accept the schedule is wrong to a degree, and then start looking to understand what the degree of error is in the schedule, the schedule becomes far more useful.

Some of the other key problems to be confronted in modern practice are:



- Understanding the limitations and inherent errors in a PDM schedule. Some of these problems were outlined in my blog ‘*Critical confusion – when activities on the critical path don’t compute.....*’⁸. Another issue is critical links; work by Murray Woolf suggests 30% of most critical paths are actually on the links, not the activities, but the work of the project is defined by the activities and every delay claim is based on delays to work..... These are fundamental issues.
- Recognising any estimate about a future outcome is probabilistic and has a range. Using Monte Carlo or even the old fashioned PERT will frequently show the activities and paths with most influence on the project’s outcome are different to the

⁴ Different approaches are available but rarely used. For one, the **CIOB Time and Cost Management Contract Suite 2015**, see: <http://www.mosaicprojects.com.au/Training-CIOB-CPC2013.html>

⁵ For more on **schedule levels** see: http://www.mosaicprojects.com.au/PDF/Schedule_Levels.pdf

⁶ *Empirical Model-Building and Response Surfaces* (1987)

⁷ *Science and Statistics* (1976)

⁸ **Critical confusion – when activities on the critical path don’t compute.....** see: <https://mosaicprojects.wordpress.com/2016/06/12/critical-confusion-when-activities-on-the-critical-path-dont-compute/>

deterministic CPM critical path. Modern practice largely ignores the probabilistic critical path (or paths).

- Risk events have different degrees of impact on the schedule. Modelling risk is essential, but rarely done.
- The problems associated with resource optimisation and critical resources⁹ (basically ignored in standard CPM tools).
- Volume of work -v- focusing on the ‘red line’ – all of the work has to be done eventually! Focusing exclusively on the CPM critical path whilst burning float on other paths is simply deferring an escalating problem for a short period. Earned Schedule¹⁰ is one solution.

Current scheduling practice largely ignores all of these issues, and many schedulers are completely ignorant them. The new *Schedule Assessment Guide*¹¹ issued by the USA, GAO goes a long way towards driving a solution to some of these basic issues but is very new and has yet to make an impact on general practice.

Summary

The ability of organisations to maximise the value they achieve from an investment in a project or program depends on how well the work is managed. One of the key tools needed to efficiently manage the work of a project is a realistic and achievable schedule. But there is a ‘chicken and egg’ problem.

Most executives have never seen a well-managed schedule in use on a successful project. There are an increasing examples of good practice in the public domain, including Cross-Rail in London, but these are ‘third hand’ reports, not lived experience. As a consequence, the Executives are reluctant to invest in developing the capabilities needed to produce good schedules (including training skilled schedulers), and as a consequence they continue to experience bad scheduling and controls and seek to minimise their costs. As a consequence, projects fail and value is destroyed.

Breaking this cycle will not be easy – my suggestion for the place to start is the scheduling community working to increase the skills of schedulers so at least the capability to do effective work is present. Then all that’s needed is an opportunity.....

**For free resources and more on scheduling skills development
visit our website: <http://www.planning-controls.com.au/>**

This article is part of Mosaic’s *Project Knowledge Index*
to view and download a wide range of published papers and articles see:
http://www.mosaicprojects.com.au/PM-Knowledge_Index.html

⁹ For more on *resource optimisation* see: http://www.mosaicprojects.com.au/Resources_Papers_152.html

¹⁰ For more on *earned schedule* see: <http://www.earnedschedule.com/>

¹¹ See more on the *Schedule Assessment Guide* at:
<https://mosaicprojects.wordpress.com/2015/12/31/gao-schedule-assessment-guide-released/>

