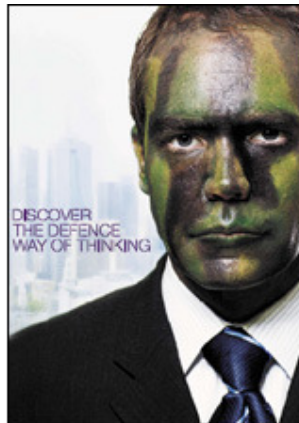


SCHEDULING IN A DEFENCE ENVIRONMENT

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Introduction

Earned Value is extremely useful as a measure of the efficiency of consumption of resources on a project (typically money) and has a proven track record of accurately predicting final costs from relatively early in the project. However, its schedule performance indicators (SV and SPI) are far less satisfactory. The emergence of Earned Schedule will most certainly address some of these shortcomings providing an accurate predictor of a project's overall duration (based on trends to date) but projects are not managed in the future, they are managed every day.

The only tool for effective day-to-day coordination of a project's work and the key underpinning of the 'time phased budget' needed for valid EV and ES calculations is an effective, useful and relevant schedule. Unfortunately, the current state of scheduling is not good, and scheduling is consistently failing to deliver the expected outcomes on large complicated projects in both the Defence arena and elsewhere.

This paper identifies some of the symptoms of scheduling failure and then briefly addresses three topics:

- A discussion of the real purpose and usefulness of scheduling
- The current 'state of play' in the development of scheduling
- Some emerging trends that may re-focus scheduling

The Usefulness of Scheduling

The primary purpose of any schedule should be to help the project manager and project team optimise the overall strategy for the delivery of the project, coordinate workflows and assist in the decision-making processes needed to resolve dilemmas and issues on a day-to-day basis. These objectives are routinely compromised by a range of 'other' considerations that have usurped the scheduling function; this paper will look at two.

The most damaging influence is the transformation of the schedule into a contract document. This simple move causes distortions to the optimal logic as parties to the contract battle to create a tool for the inevitable claims and disputes¹. The 'freezing' of the contract schedule advocated in many contracts compounds the problem and causes more distortion over time as actual work deviates from the plan. Undoubtedly the client has a right to expect delivery of its project on time (the overall objective), and maybe key interim milestones, but monitoring these contractual obligations should not require an artificially 'fixed' schedule and a daily focus on tasks in the schedule to see where the 'project' is failing to perform. Every task duration and scheduled date is a prediction of what may happen in the future it is not a guarantee it will happen (particularly several years into the future)². Focusing on a 'failure' to perform is damaging and virtually prevents the project team using the schedule as a tool to help achieve the overall objectives of a project by adapting strategies and plans to deal with reality as it unfolds.

The second most damaging influence is the ever increasing levels of detail built into schedules. If the purpose of a schedule is to coordinate workflow and help in decision making this is not helped by having tens of thousands of detailed activities that seek to

¹ For more on the calculation and consequences of 'float' and the 'critical path' see '*Float - Is It Real?*': https://mosaicprojects.com.au/PDF_Papers/P043_Float-Is_it_Real.pdf

² For more on the issues around assigning task durations see '*The Cost of Time - or who's duration is it anyway?*': https://mosaicprojects.com.au/PDF_Papers/P009_The_Cost_of_Time.pdf

‘control’ the progress of the work. The inherent uncertainty in every schedule duration calculation (work content x resource availability x production rate) is not helped by excessive detail. No one knows for sure how many resources will be available in 3 months time to ‘paint a deck’ so having one task of 3 weeks for the whole job or 15 tasks of 1 day each to provide detail control makes no difference; the attempt to control work in detail months in advance is doomed to fail. The workers and managers on the job, at the time will make their own decisions as to the optimum way to tackle the job and ignore the schedule.

To re-assert the usefulness of the schedule, schedule developers need to focus on the needs of the project manager in managing the project and let other tools in the project management lexicon deal with the minutiae of day-to-day work assignments, etc. Traditionally, short term schedules and daily work assignments were used to translate the overall schedule objectives into planned and agreed actions.

These idea of using the schedule to set the coordinated framework of what needs to be achieved and allowing the workers and section managers determine the best way to achieve the objectives are not new; Douglas McGregor in his 1960 book, *The Human Side of Enterprise* described Theory X and Theory Y. He suggested the ‘command-and-control’ approach of theory X was limiting and in any complex endeavour the collaborative and motivational ideas in Theory Y are likely to deliver better outcomes³.

The State of Play

This year saw the 50th anniversary of the start of critical path scheduling⁴. It has also seen a number of key events focussing on the re-vitalisation of project scheduling.

PMI’s Practice Standard for Scheduling

The most important initiative has been the publication by PMI of its Practice Standard for Scheduling⁵. This standard covers three areas:

1. Chapters 1 and 2 place the standard in the context of the PMBOK Guide 3rd Edition and define a framework for the development of a schedule.
2. Chapter 3 describes ‘good scheduling practice’ in terms that are relevant to most projects most of the time.
3. Chapter 4 describes the components used in developing a schedule; whether they are mandatory for good scheduling practice or optional, the behaviour of the component and what represents ‘good practice’ in its use. Chapter 5 provides a methodology for assessing the conformance of the schedule.

The most interesting development is the conformance scoring system that allows schedules to be rated for conformance with accepted good practice. This version of the Standards allows assessors to assess whether a schedule uses (ie contains) a component correctly, not the way it is utilised (ie, its usefulness). The expectation is that as the standard and practice of scheduling evolves, the subjective issues around utilisation (the art of scheduling) will also be capable of being measured.

³ For more on Theory X, Theory Y see: http://en.wikipedia.org/wiki/Theory_X_and_theory_Y

⁴ See ‘A Brief History of Scheduling’ at: <https://mosaicprojects.com.au/PMKI-ZSY-020.php#Overview>

⁵ The Practice Standard for Scheduling, ISBN 13:978-1-930699-84-7

PMI College of Scheduling, Scheduling Excellence Initiative (SEI)

The SEI is an operational entity within the PMI College of Scheduling that is tasked with developing products and providing services. SEI is currently focused on developing and publishing the Scheduling Enhancement Series (SES); a multi-volume reference centre for scheduling concepts methodologies and best practices. The SES production effort is in the early stages of development and volunteer teams are working on initial assignments. SEI's work will be accomplished through the interaction of six key committees:

COMMITTEE NAME	PRIMARY FOCUS
Schedule Management (SM)	Pre-Project Planning; Pre-Project Schedule Design and Development; Schedule Maintenance and Usage.
Schedule Impact Analysis (SIA)	Aspects of schedule usage (before, during, and after project) related to contracts and time-associated claims.
Industry Focus (IF)	Industry-specific commentary on work products of other Committees.
Software Enrichment (SE)	Recommendations on how to improve the quality of scheduling software design, functionality, and usage.
Education (ED)	Recommendations on how to improve the quality of scheduling in academic and vocational education and training
Research & Innovation (RI)	Objective and conflict-free intellectual treatment of methodological and technological topics.

Certifications for Schedulers

At the moment, the only scheduling certification is the AACE's 'Planning & Scheduling Professional Certification' this is a 4 part exam extending over 7 Hrs. The eligibility requirement to sit the exam is 8 years experience⁶. Naturally the take up is limited to high calibre professional planners needing validation of their skills for specialist roles such as being an expert witness.

PMI has announced a new Scheduling Certification based on the PMBOK and the Practice Standard for Scheduling. Details will be available later this year and Mosaic is keeping a close watching brief on developments.

Local Scheduling Interests

AIPM are planning to initiate a Scheduling SIG in conjunction with DMO. The PMI Canberra Chapter is working with a team to develop a local 'campus' of the PMI College of Scheduling possibly linked with the PMI College of Performance Management.

⁶ For more on the Association for the Advancement of Cost Engineering's certification see: <http://www.aacei.org/certification/certExplained.shtml>

Emerging Trends

This practice of scheduling is being strongly debated. On one side are the command-and-control advocates who seek more power in their tools and define schedules by the degree of control they exert.

On the other side of the debate are the collaborative managers who are looking to redefine the usefulness of the schedule in an emerging age of alliance contracts, partnerships and knowledge workers. One of the most interesting and challenging books to emerge from this school of thought is by Murray Woolf.

Murray identifies and discusses a number of ideas that are relevant to all projects. I will cover just a few:

- Who owns total float when every activity in a chain is shown with the same float value? Murray advocates a system for calculating 'individual activity float'.
- Some 40% of most critical paths are through links in the schedule. Whilst there are recognised processes for estimating the duration of a task there are very few guidelines for estimating the duration of a Start-to-Start or Finish-to-Finish link.
- Over ten years of study, he found that most tasks finished within their estimated duration and 80% of delays occurred in the 'administrative work' needed to allow tasks to start. This 'administrative work' (eg, making sure the work space was clean) was never in the schedule.
- Most of the delay on most projects was caused by the myriad of small disruptions and dilemmas encountered day to day rather than the 'big ticket' items found in most delay claims. Murray advocates a system for measuring the momentum of work on a project and suggests maintaining this momentum is critical to project success.

The book is entitled 'Faster Construction Projects with CPM Scheduling'⁷ I feel the name is totally inappropriate, this is an important book for all senior project schedulers to read.

Conclusions

Project scheduling is in a mess if not a crisis:

- There is a chronic shortage of skilled schedulers world-wide.
- Far too many people see scheduling as firstly a tools based process, their primary requirement being an ability to drive the software, their secondary requirement a controls process reporting on what has gone wrong (it's too late by then).
- The art of planning has been largely lost. The art is to use the tools wisely to develop elegantly useful schedules that pro-actively support project management in optimising the overall strategy for the delivery of the project, coordinating workflows and assisting in timely decision making.
- Too many schedulers are employed as data processors collecting information for 'the claim', rather than as skilled and trusted advisors to the PM helping prevent problems in the first place.

Developments in the last year have started to move in the right direction:

- We now have a valid and useful international practice standard.
- The SEI is working to further define and develop 'best practices and guidelines'.

⁷ To purchase a copy of 'Faster Construction Projects with CPM Scheduling' visit: <http://www.ics-global.com>

Scheduling in a Defence Environment

- There will soon be a practical certification for schedulers. And
- We can rate the technical competence of a schedule (but not its usefulness - yet).

Hopefully the advent of scheduling SIGs and Campuses in Australia will serve to educate and inform schedulers on their most useful role supporting the project manager; and the advent of a scheduling certification will encourage schedulers to be trained in more than the nuances of their preferred tool. Whilst it is essential schedulers know how to run their software and understand its capabilities and limitations, knowing why they are working on a schedule is probably more important.

Lastly everyone involved with the schedule need to recognise it is a modelling process that helps communicate and coordinate ideas about what might happen in the future, it is not a cartographic process mapping what already exists. Mapping what already exists is impossible when it comes to the future and only helps the lawyers when studying the past.

As professional schedulers, we have a long way to go to live up to the promises made 50 years ago with the advent of CPM.

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