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Assessing Delay & Disruption in Agile & Distributed Projects

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Introduction

This presentation is the latest in a series looking at project control challenges in **Agile** and **Distributed*** projects

Previous papers include:

Scheduling Challenges in Agile & Distributed Projects identified classes of project:

- where CPM is a valid tool (Class 1 & 2)

- where CPM is not used, or useful (Class 3)

- where CPM is applied inappropriately (Class 4)

Https://mosaicprojects.com.au/PDF_Papers/P208_Scheduling_Challenges_in_Agile_+_Distributed_Projects.pdf

*Distributed projects are projects that consist of a number of separate elements that are largely independent of each other – think of windfarm turbine towers

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Introduction

Predicting Completion in Agile & Distributed Projects introduces WPM

Work Performance Management (WPM) offers a solution to the challenges of:

1. Assessing the current status of a Class 3 project
2. Predicting the completion of the project.

https://mosaicprojects.com.au/PDF_Papers/P214_Predicting_Completion_In_Agile_+_Distributed_Projects.pdf

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Introduction

Class 3 projects = Agile & Distributed

Key Characteristics

1. Flexibility in work sequencing (particularly agile)
2. Limited overall constraints on sequencing (there are always a few)
3. Most work sequence can be changed relatively easily

Agile does not use CPM as a matter of choice

Distributed projects may have a CPM schedule but the sequence of working is easily changed if needed

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Introduction

Progress on Class 3 projects can be assessed using **WPM** or **Earned Schedule** (ES), the key difference is WPM does not need an EVM implementation

Calculations are based on the amount of work planned to be complete at a point in time and the amount actually accomplished. See:

- How WPM Works

- WPM for Agile Projects

- WPM for Lean & Distributed Projects

- WPM Solves CPM Optimism

https://mosaicprojects.com.au/PMKI-SCH-041.php#Overview

Introduction

The gap – Assessing Delay and Disruption!

ES and WPM can calculate the status, and predict the completion of Class 3 projects

But cannot separate the effect of individual delays (their approach is holistic)

Forensic CPM schedule calculations have been rejected by the courts on a number of Distributed projects:

- Costain Ltd v Charles Haswell & Partners Ltd [2009] EWHC* B25 (TCC - 24 September 2009),

- White Constructions Pty Ltd v PBS Holdings Pty Ltd [2019] NSWSC* 1166, (6th September 2019).

This presentation looks at assessing delay and disruption without a CPM schedule

Introduction

Presentation outline

1. The basis of delay assessment

2. Why CPM does not work

3. Assessing delay and disruption without CPM
   a) Assessing full project delays
   b) Homogeneous team delays
   c) Driving resource workflow delays
   d) Work volume delay assessment

4. The way forward

5. Conclusions

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The basis of delay assessment

Delay means the time for completion of the project will be extended

If a delay is approved, an Extension of Time (EOT) for the completion is awarded

Disruption means the work of the project is made less efficient thereby increasing costs

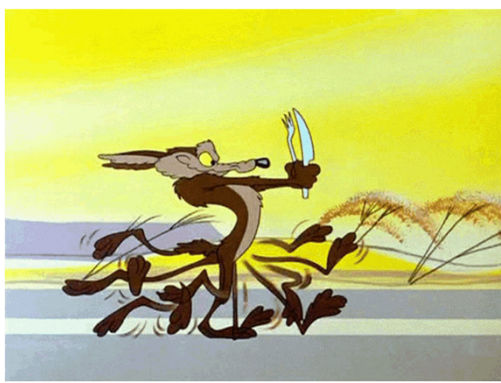Disruption of non-critical work has a cost consequence but does not generate an EOT

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For more papers in this series see: https://mosaicprojects.com.au/PMKI.php

The basis of delay assessment

To show delay or disruption occurred you need:

A plan that is in action:

The basis of delay assessment

To show delay or disruption occurred you need:

A prospective (or actual) intervening event*:

Intervening event

* An ***intervening event*** is unforeseen occurrence which interferes with or disrupts the planned progress of the work

For more papers in this series see: https://mosaicprojects.com.au/PMKI.php

The basis of delay assessment

To show delay or disruption occurred you need:

The intervening event has to impact the planned work:

The basis of delay assessment

To show delay or disruption occurred you need:
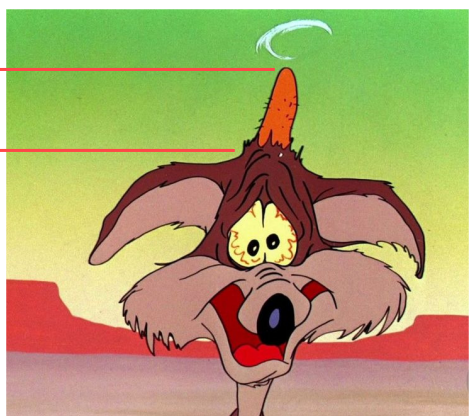
Who owns the risk (consequences) needs to be determined:

The basis of delay assessment

To show delay or disruption occurred you need:

And the consequences need to be measured:
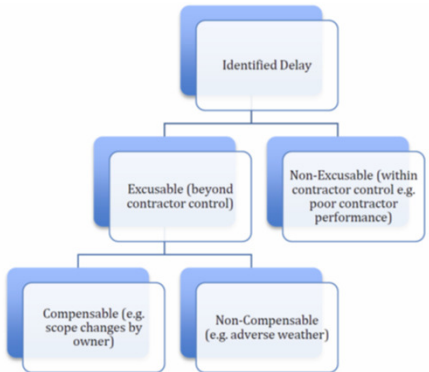
Consequences

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The basis of delay assessment

The allocation of risk depends on the contract:

The concepts are not complex (or difficult)

The difficulty is providing defensible evidence of:

1. The extent of the delay and disruption
2. The effect of the delay on the project

People were doing this for 100+ years before CPM was invented

Identified Delay

Excusable (beyond contractor control)

Non-Excusable (within contractor control e.g. poor contractor performance)

Compensable (e.g. scope changes by owner)

Non-Compensable (e.g. adverse weather)

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Why CPM does not work

CPM is a viable way to demonstrate delay in Class 1 & 2 projects

All you need is:

1. A realistic CPM schedule that represents the flow of the work
2. The project working to the schedule
3. No easy alternatives other than following the plan – there's really only one way to do the work

The CPM schedule should be prospective but can be developed after the project (as-built)

The two recognized frameworks for assessing delay are based on a competent CPM schedule

- AACEi *Recommended Practice 29R-03 Forensic Schedule Analysis* and

- SCL *Delay and Disruption Protocol* (2nd edition)

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Why CPM does not work

CPM is not useful for Class 3 & 4 projects

Agile projects simply don't use a CPM schedule

Distributed projects allow multiple way of working:

[Clause 233] *….experts have agreed that the delays to the RGF and IW [foundations] were critical delays since those buildings were on the critical path of the project at the relevant time. Ordinarily therefore one would expect, other things being equal, that the project completion date would be pushed out at the end of the job by the same or a similar period to the period of delay to those buildings.* **However, as experience shows on construction sites, many supervening events can take place which will falsify such an assumed result. For example, the Contractor may rearrange his programme so that other activities are accelerated or carried out in a different sequence thereby reducing the initial delays**.

Costain Ltd v Charles Haswell & Partners Ltd

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Why CPM does not work

CPM is not useful for Class 3 & 4 projects

In both of these projects:

- Expert evidence based on CPM was rejected

- The fact a delay occurred was agreed

- But the consequences on completion were **not proved**

A different paradigm is needed

White Constructions Pty Ltd v PBS Holdings Pty Ltd

Assessing delay & disruption without CPM

There is no general requirement to use CPM to assess delay and disruption.

From *White*: [Clause 191]   *Mr McIntyre's opinion, upon which I propose to act, is that for the purpose of any particular case, the fact that a method appears in the Protocol does not give it any standing, and the fact that a method, which is otherwise logical or rational, but does not appear in the Protocol, does not deny it standing.*

Note: This is the basically same wording as contained in the *Delay and Disruption Protocol* and *RP 29R-03*

The concept underpinning WPM is a Class 3 project has an amount of work to do, the work is done by resources and the time needed is a function of the resources and the quantity of work


Assessing delay & disruption without CPM

The concept underpinning WPM is a Class 3 project has an amount of work to do, the work is done by resources and the time needed is a function of the resources and the quantity of work

- The sequence of working can be varied either:
  - intentionally (agile / lean construction) or
  - in response to circumstances
- What matters is keeping the resources working at 100%
- When an intervening event disrupts the work a delay occurs
- The assessment of the delay depends on measuring the impact of the intervening event on the productivity of the key resources controlling project completion
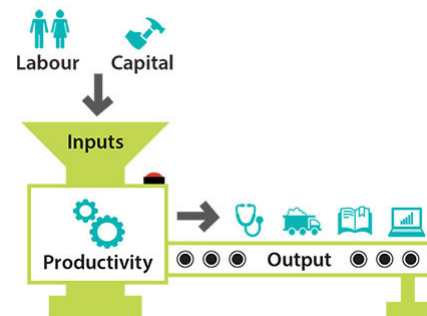
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Assessing full project delays

Full project delays are simplest

- Examples:
  - Project wide industrial action
  - Major weather events
- Delay assessment requires:
  - The time the event started
  - The time it finished
- Agreement may be needed particularly around the end of the delay period

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Homogeneous team delays

Where there is a single cross functional resource team doing the work

- Examples:
  - Agile IT projects using a single team
  - Bulk earthworks

- Delay assessment requires:
  - The duration of the delay
  - The % of the resource capacity affected

- The event may cause a 100% loss of productivity, or a partial loss. Where a partial loss of productivity occurs, this needs to be adjusted to an equivalent period of total loss

- If 3 out of 5 scrapers cannot work the loss of productivity is 60% - a 5 day delay = 3 days lost time


Driving resource workflow delays

Where there is one resource that controls the overall pace of work

- Examples:
  - The main crane erecting windfarm turbines
  - The software developers in a complex IT project

- Delay assessment requires:
  - The duration of the delay affecting the driving resource
  - Delays affecting other resources are cost issues

- The driving resource may change during different phases of the project – these change points need to be agreed.

Driving resource workflow delays

The delay is focused on resource productivity, not the sequence of work
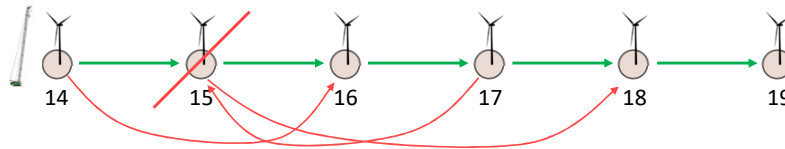
Planned sequence shown in green – 2 days per tower (including relocation of 500m each)

4 day delay on tower 15 (CPM theory = 4 days delay to project)

Revised sequence 14 – 16 – 17 – 15 – 18 – 19

Actual delay =
- Original distance = 2000 meters
- Revised distance = 4000 meters
- Additional travel = 2000 meters @ 400 meters per hour = 5 hours delay

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Work volume delay assessment

These are usually changes in scope

The client orders additional features on a software development, the effect can be calculated as follows:

- Establish the production rate of the driving resource. In this case:
  - The project currently includes 160 story points (all approximately the same size)
  - the sprint teams are expected to deliver the 160 points in 40 days – an average of 4 story points per day

- The new features are estimated to involve 20 story points

- The additional time required is 20/4 = 5 Days

It does not matter when in the overall flow of the project the new features are worked on

Assessing delay & disruption without CPM

The requirements to implement these ideas are:

- Good record keeping

- Common sense

- Agreement on the approach for each event

Ideally the delays are agreed contemporaneously. But the approach works in Arbitration (even with a contract clause requiring a CPM based assessment)

Generally, contract law will not require a project to increase its resources to compensate for additional work

Entitlement to reimbursement of costs for the delay will depend on the risk allocation in the contract

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The way forward

CPM does not work on agile and distributed projects, the courts have said so!

Agile and Lean approaches focus on short term iterative planning – no CPM

But to improve the assessment of delay and disruption:

- Many traditional forms of contract will need to be improved

- Protocols need to be developed for dealing with the issues pragmatically within existing forms of contract

- Record keeping needs to be refocused and the parties need to deal with issues real-time

But the biggest challenge moving forward will be to overcome 65 years of practice and recognize Class 3 and 4 projects need a different approach

For more papers in this series see: https://mosaicprojects.com.au/PMKI.php

Conclusions

There is a lot of work needed in this area:

- Contract improvements are required to allow the use of WPM or other advanced tools on Class 3 projects
- Protocols need to be developed for dealing with the issues discussed today pragmatically within existing forms of contract
  - For the contractor
  - For the superintendent / client

Watch this space, we are working to develop these concept …………

Conclusions

An extended version of this presentation will be published in the **April** edition of:

https://pmworldjournal.com/

Questions?

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