Peer Review of A Schedule

By:

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Introduction

In a recent report by the PMI recently (February 14, 2017) released, shows that Australia has a very poor track record, along with other parts of the world in managing large infrastructure projects. Cost blowouts and delays are common, especially in Government funded transport, hospital and communications projects. The NBN has had to recently obtain additional funding from the Federal Government. The new Royal Adelaide Hospital has overrun its budget by almost thirty percent and is will be over fifteen months late when it will be delivered.

A major area that the report focuses on is that billions of dollars in wastage on major projects continues to occur globally, but in recent years it has improved, however wastage in Australia still lags the improving global average.
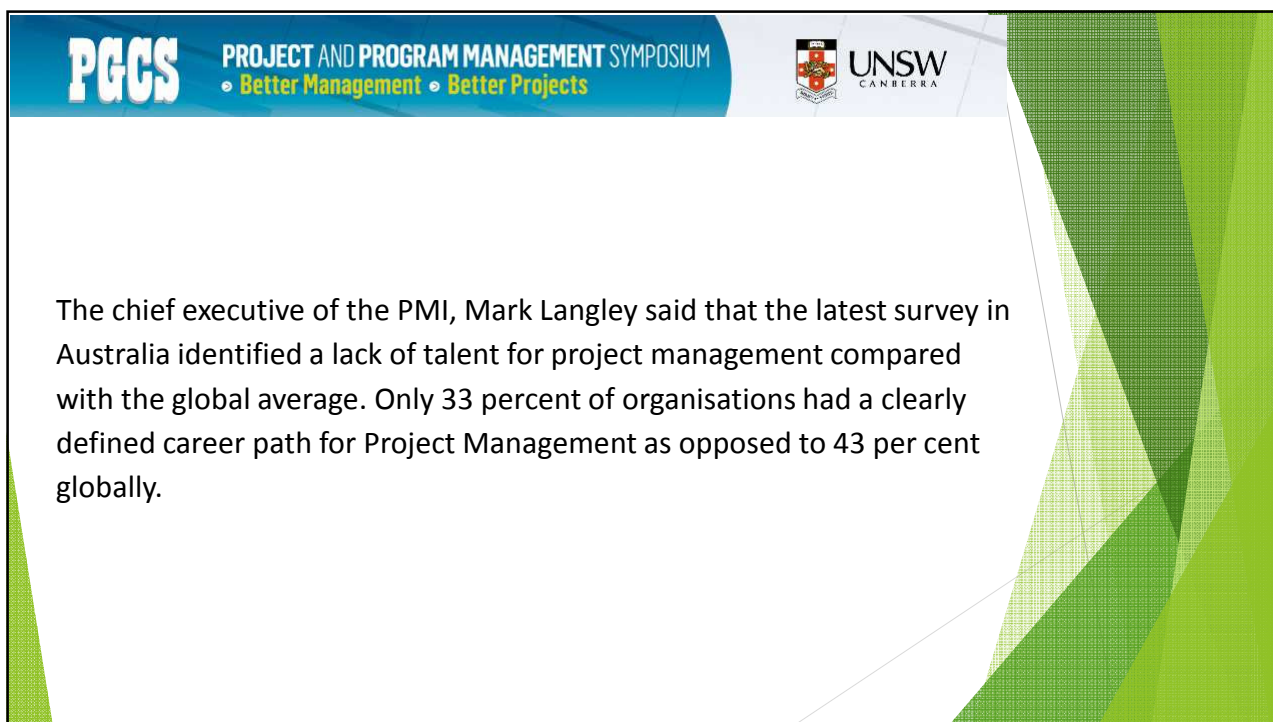
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The chief executive of the PMI, Mark Langley said that the latest survey in Australia identified a lack of talent for project management compared with the global average. Only 33 percent of organisations had a clearly defined career path for Project Management as opposed to 43 per cent globally.

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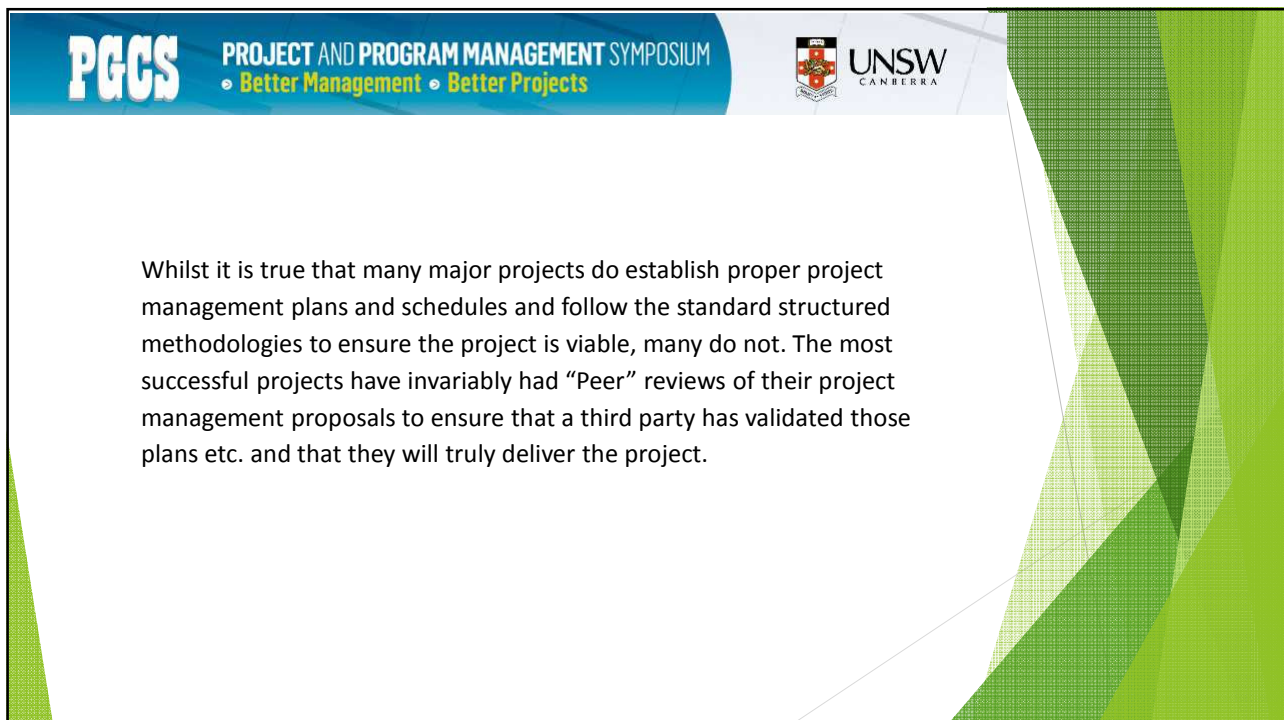
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To overcome wastage Lean Construction has been introduced in the past few years, *LEAN* is a manufacturing philosophy that removes non-value adding activity and changes all stakeholders in the value chain. *LEAN Construction* is the adaption of *LEAN* to project delivery. It is an excellent framework with which to deliver a transformation in *construction* productivity for major Australian large dollar value projects

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Whilst it is true that many major projects do establish proper project management plans and schedules and follow the standard structured methodologies to ensure the project is viable, many do not. The most successful projects have invariably had "Peer" reviews of their project management proposals to ensure that a third party has validated those plans etc. and that they will truly deliver the project.

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On investigating those which have failed, it was noted than many of them did not perform the necessary in depth project planning and scheduling as management did not see the value of spending the time and or the funding. No peer reviews or audits had taken place and as such any scheduling or cost shortcoming failed to be observed and so another project failure occurs. However it is well known that taking the time and properly funding the project management, planning and scheduling and perform independent peer reviews do deliver successful projects.

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The ASC construction of the Collins class is a case in point when a full in depth project definition study was performed over a three year period which were heavily peer reviewed throughout that time ensured that before actually starting the construction phase it would be successful. These peer reviews (audits) meant all the likely problems that would occur on a $5.4 billion project (in 1991) were in the main resolved and that the project would achieve its goals which it did.

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The use of Lean Construction techniques to prevent
wastage and with a proper duration allowed to provide
in depth planning and scheduling and cost controls
with appropriate peer reviews and audits for all major
projects will no doubt improve the rate of success in
delivery.

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Peer Reviewing a Schedule

Establishing the peer review it has been assumed that the client
is using Primavera P6, with versions running from V6.3 to 17.1.
The peer review undertakes to examine the most common

Establishing the review
Goals

- Examine and Confirm that the schedule is reasonable and attainable
- Determine that the Contractor's Means and Methods understandable
- Establish a good baseline for monitoring
- Verify and Validate durations
- Verify and validate logic and sequencing
- Identify claims positioning issues
- Identify risks in schedule and assumptions
- Document concerns

Baseline Schedule Review

- Review Scheduling Specification
- Confirm Submittal Completeness
- Develop familiarity with the Project (review the contract)
- Import Schedule & verify
- Review Schedule Architecture
- Review narrative of project description
- Review Sequencing
- Evaluate Metrics and Statistics
- Perform Analysis
- Write Report

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Baseline Schedule Review

Review Scheduling Specification

- Section Numbers 101230 or 10.1.23.0
- Check Related Specifications Sections or special provisions
- Software Requirements
- Data Exchange requirements
- Master dictionaries / reports
  - Activity Codes requirements
  - ID coding requirements
- Preconstruction meeting

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- Experience and qualifications of the scheduler
- Required submittal contents
- Client Contracted milestone dates and deliverables
- Determine Total Float ownership and document
- CPM network requirements
- Definition of Durations and Restrictions
- Initial Schedule Submission
- Fully detailed project schedule (baseline) submission
- Schedule updates

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- Delay and extension of time
    o Notification requirements
- Early Completion schedules
- Final as-built submittal
- Resource and Cost loading
- Project Description requirements
- Prohibitions on manipulation

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Baseline Schedule Review

Gaining Familiarity with the project

- Review Plans and Specification
- Review project specific documents and manuals
- Visit project site
- Review construction methodology
- Bring in subject matter experts if necessary

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Baseline Schedule Review

Confirm Submittal Completeness

- Compare to schedule specification requirements
- Notify Contractor at once if not complete
- Do not start the review until submittal is complete
- Characteristic missing items
  o Schedule Methodology description
  o Electronic Files
  o Define explanation of Calendars, Lags, Activity Codes, Constraints, Resources, Costs
  o Milestones and Definitions of Milestones
- If costs and / or resources are missing perform review in phases

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Baseline Schedule Review

Import Schedule & Verify

- Keep original submittal file, create copy to review
- Review in Original software if possible
- Recognize any issues with import in various software packages
- Create checklist to identify potential import issues
- Example – Microsoft MPX to Primavera 6 V8.4
  o Calendar Issues
  o Duration Issues
  o Blank Lines in MPX
  o Remove the Summary Task
  o Remove Summary Logic
  o Date Impositions
- Ensure and verify that imported schedule used to review and analyse is identical to the original submitted schedule
- Create Checklist for reviews

Baseline Schedule Review

Review Schedule Architecture

- Validate Schedule Rules and settings
- F9 – Recalculate Schedule
- Review Organizational Tools

Review Schedule Construction

- Evaluate Activities – check against contractual requirements
- Review logic
  - o Check for Missing Predecessors
  - o Check for Missing Successors
  - o Check for Open Ends
  - o Check for superfluous logic
- Determine Validity of the Critical Path

Baseline Schedule Review

Review Schedule Architecture

- Retained Logic vs Progress Override – Note Progress Override is not acceptable
  - o Will not affect Baseline, but may cause optimistic predictions during status reporting
- Resource and Cost Rules
  - o Estimate to Complete setting may allow Estimate at Completion to change
- Validate and understand influence of all settings and how they impact Earned Value Management and reports
- Evaluate how the Critical Path is calculated
  - o Longest Path – Primavera
  - o Total Float – zero value

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Baseline Schedule Review

Review Schedule Architecture

- Recalculate Schedule – ensure no changes to dates
- Validate all Completion Dates, validate against Contractual requirements
- Validate all intermediate milestones dates
  - o Ensure Start Milestones are properly indicated
  - o Ensure Finish Milestones are properly indicated
- Review Organizational Tools
  - o Validate Activity Code Dictionaries
  - o Validate Resource Code Dictionaries
  - o Validate calendars – Global and User
  - o Validate EPS
  - o Validate WBS
  - o Check for UDF's (P6)

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Baseline Schedule Review

Review Schedule Construction

- Evaluate Activities
  - o Sort by Activity Description (Name in MS Project)
    - ▪ The AACEi Publication No 29R-02, is the guide used, as it is the recommended practice for Identification of Activities
    - ▪ Ensure all descriptions are consistent and unique and can stand alone
    - ▪ Ensure that all items which may the project are visible as activities, procurement especially, contracted deliverables, design drawings and other admin work
    - ▪ Determine that the activity description does capture the full scope of work
    - ▪ Compare descriptions for reasonable and comparable to the original duration
  - o Sort by original Duration
    - ▪ Review Contract for specification of maximum times
    - ▪ Ensure that the Original Durations are reasonable (no longer than "two status periods")

Baseline Schedule Review

Review Schedule Construction

- Review Logic
  - o Use of AACEi Publication No. 24R-03, the Recommended Practice for Developing Activity Logic for Guidelines
  - o Check Open-ended relationships (Dangles)
    - ▪ There must only be two, the start and the end of the Critical Path Logic
    - ▪ Dangles caused inaccuracies in the critical path calculations and generates false Critical Paths
    - ▪ Beware of "dangling" activities resulting from SS or FF dependency lags
    - ▪ Negative durations on SS, FF or FS dependencies which will cause Predecessor open-ended after a status update
  - o Evaluate Relationships (dependencies)
    - ▪ Check on all Lags
    - ▪ Filter by Trade, check same-trade relationships
    - ▪ Filter by Contractor, check those relationships

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- Nothing is Critical due to heavy use of constraints
- Numerous lags, maybe not identified, inserted in the Critical Path forcing it through specific activities
- Has there been any weather planning been included in Critical Path activities or will adverse weather cause slippage

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Baseline Schedule Review

Review Schedule Construction

- Evaluation of Near Critical Paths
  - o Determine how much total float constitutes "near critical path"
  - o What is the volume of work just off the Critical Path?
  - o Review Longest Path and Lowest Total Float paths
    - Recommended review of Total Float is < ½ Reporting Period
  - o Sort by Total Float
    - Validate reasonableness of high Float items
    - Is there a consistent range of TF?
    - Many activities with high Total float indicates under developed logic
    - All low Total float indicates inappropriate logic

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- Sort by Late Start
  - As expected this is the worst case scenario of work flow
  - Start at end of schedule and see if reasonable
  - Sort by Late Start, Order Week Ascending, check if the amount of work is possible
  - Review the Resources piling (view Histograms) can they fit into the spaces
- Sort by Early Start
  - Sequence by Early Start, Order Week Ascending, once again review the amount of work planned each week is feasible and reasonable
  - How many resources are piling up?
- Sequence by Early start, Sort by Late Start
  - Summarize to early Start, review the overlaps by each week
  - Focus the review on strong overlaps (indicates missing relationships)
  - Focus on small segments of project working concurrently

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- Review Resources
  - Review for resource "soft" logic used to control flow of workers from area to area
  - Schedules without reasonable soft logic will be most likely to show a lot of high Total Float values (more than 5% is out of range as per DCMA)
  - Overuse of soft logic can sequester Total Float and forces Critical Path
  - Durations should be resource-based, that is it is calculated by Production Rate x Quantity, so resource planning is essential to project delivery success