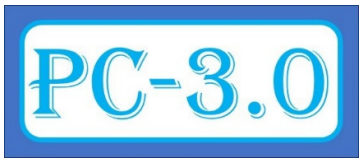
How WPM Works

Introduction

Work Performance Management (WPM) is WPM is designed to be a simple robust performance measurement system that will provide an accurate assessment of the project's status from a time management perspective. It can assess how far ahead or behind plan the work currently is, and based on this information, the likely project completion date assuming work will continue at the current rate.

This is done by comparing the amount of work achieved to date with the amount planned to be achieved. The basis of calculation used in WPM is the same as is used in Earned Schedule (ES)[1], and therefore, a similar level of usefulness and accuracy is expected from WPM. However, compared to ES, WPM is much simpler to set up and use.

The objective of this article is to describe how WPM works, and its value to the project controls function.



WPM is the core component of Project Controls 3.0 (PC-3.0). While WPM can be used on its own as an effective project controls tool, it overall effectiveness is enhanced through the implementation of the PC-3.0 paradigm. PC-3.0 shifts the focus of project management and controls towards delivering success, rather than measuring what has happened.

For more on PC-3.0 see: https://mosaicprojects.com.au/PC-3-00-Overview.php#PC-3-Overview

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The basis of WPM

The three underlaying concepts driving the WPM calculations are that the project management and team are working to their capacity, and:

1. The resources engaged in completing the project's work are finite. While the overall numbers may be increased this requires management action.
2. The productivity of the resources is unlikely to change without management action. At the present time management is using the resources as effectively as possible.
3. The best indication of future performance is prior performance.

Therefore, by assessing the project's performance to date and comparing the work achieved to the plan both the current status (variance), the variance at completion, and the predicted completion date can be determined.

[1] For more on ***Earned Schedule*** see: https://mosaicprojects.com.au/PMKI-SCH-040.php#Process2

The two requirements to implement WPM are:

- A consistent metric to measure the work planned and accomplished, and
- A simple but robust assessment of when the work was planned to be done.

WPM units of work

The core element in developing an effective WPM system is defining a robust metric to measure the quantity of work (planned and actual) that can be applied uniformly across the core work of the project[2]. The measure does not need to include peripheral and support activities, but should cover the bulk of the productive work of the project.

Scheduling the units of work

Scheduling the work needs to be as realistic as possible; existing plans being used by the project team should be used where available: there may be an overall roadmap, or a detailed schedule, of some other form of planning that identifies when the work is planned be done. If these tools are not available, a straightforward pragmatic approach will suffice.

For example, looking at a 20-week software project that has 27 stories of various size, and a total of 86 story points. In the absence of any other information, you could safely assume:

- The first 2 weeks are needed for team development, planning and other start-up processes
- Sprints are expected to take 2 weeks each, and
- the last two weeks will be for contingencies, bug fixes and other finalization work
- This leaves 16 weeks for productive work, therefore, the first stories should be delivered at the end of the first productive sprint, week 4, and all stories by the end of week 18.

This means the rate of planned production between the start of week 2, and the end of week 18 is 86/16 = 5.375 story points per week. Based on these assumptions, at the end of week 4 (2 weeks of production) we can expect 10+ story points to be complete, and at the end of week 18 all 86 story points complete. The rest of the planned distribution is simply a straight line between these two points[3].

WPM calculations

WPM terminology

The terminology used for the data points in WPM is:

- **WP** = Work Planned measured in an appropriate unit – cumulative over time
- **WA** = Work Accomplished measured on the same basis as WP
- **PC** = Planned Completion project duration in time units (working days, weeks, months)

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[2] More details on units of work are included in ***Overview of WPM***: https://mosaicprojects.com.au/Mag_Articles/AA037_-_Overview_of_WPM.pdf (page 3)

[3] This IT / Agile project is one of the three ***free sample projects*** that can be downloaded from: https://mosaicprojects.com.au/shop-easy-WPM_WS.php

- **TN** = Time Now the number of PC time units to the date of assessment
- **TE** = Time Earned the number of PC time units to the point where WA = WP

From this information, the work performance measures are calculated as follows:

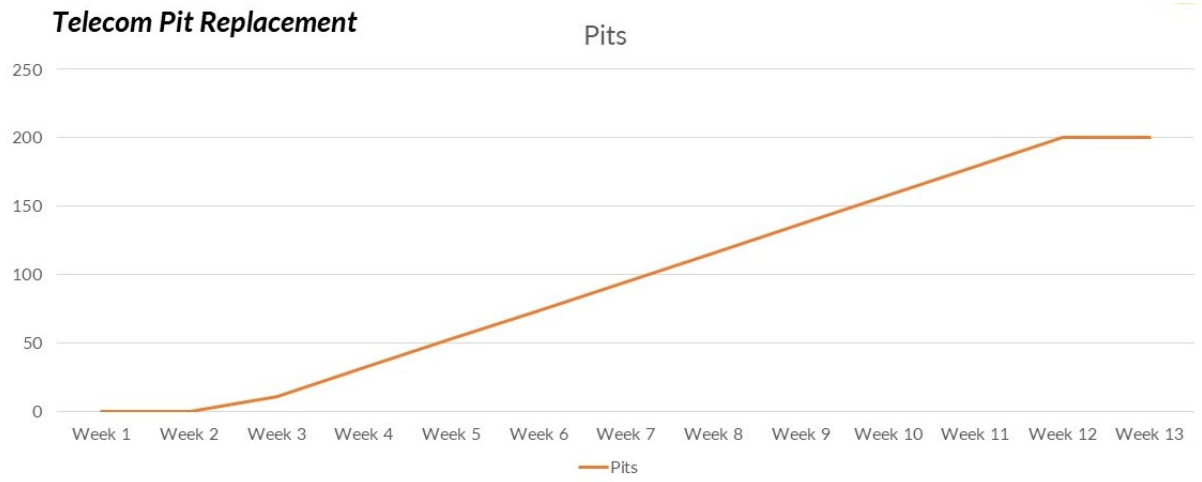
- **WPV** = Work Performed Variance **TE - TN**, negative values show the schedule slip in PC time units
- **WPI** = Work Performed Index **TE/TN**, values less than 1.0 show less work has been accomplished than planned
- **EC** = Expected Completion the expected project duration in PC time units: **PC/WPI = EC**
- **VAC =** Variance at Completion: **EC - PC**.

Developing the Baseline (PMB)

This project is to remove an environmental hazard by replacing 200 old telecommunication pits made of asbestos cement with new plastic pits. The ducts between pits are not being changed[4]. The unit of measure is a 'replaced pit'. Using previously planned durations we know:

- Contract period 13 weeks (3 months)
- 2 weeks are required for initial procurement and training
- 1 week is needed for initial learning (learning curve - 11 pits only)
- 9 weeks remain to install 189 pits at 21 per week
- Allowing 1 week for project finalization

The resulting planned rate of working is:



Assessing progress

The measured progress at the end of Week 8 shows:

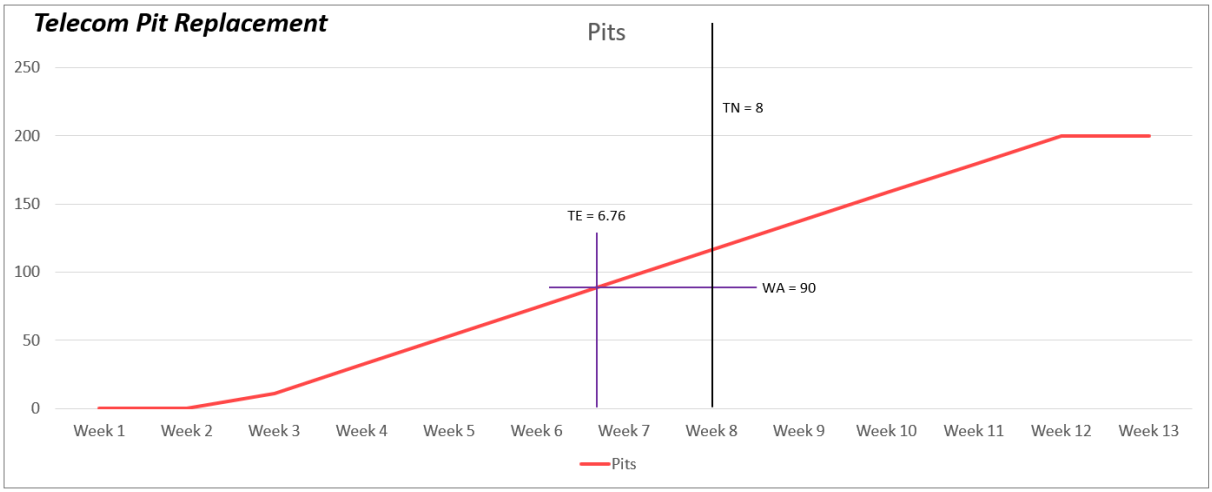
- Time Now = 8 **TN = 8**
- The actual progress is measured at 90 pits complete **WA = 90**
- The planned progress at Week 8 was 116 pits complete **WP = 116**

[4] This telecom project is one of the three free sample projects that can be downloaded from: https://mosaicprojects.com.au/shop-easy-WPM_WS.php

From the chart above, we can see 90 pits were planned to be achieved during week 7, therefore the TE is 6 and a bit weeks. To calculate the exact TE:

- We know there were 74 pits planned to be complete at the end of week 6
- We therefore know there were 90 - 74 = 16 pits completed in week 7
- We also know there were 21 pits planned for week 7

Therefore: 74 at the end of week 6 + 16/21 = 0.76 of week 7 **TE = 6.76**



The work performance variance is:
WPV = TE – TN, or 6.76 - 8 = -1.24 weeks behind schedule

And the **WPI = TE / TN, or 6.76/8.0 = 0.845**

Therefor the predicted project completion is calculated as:
EC = PC/WPI 13/0.845 = 15.38 weeks

The VAC shows project is expected to complete 13 - 15,38 = 2.38 week (or 2 weeks 2 days) late.

Using the progress information

WPM is a prediction of what may occur if nothing changes; the primary objective of WPM is to highlight issues early to encourage management action.

Trends matter! If you look at the report on the same project (printed from the Easy WPM Worksheet), you can see at week 5, the project was predicting a completion 3.93 weeks late (3 weeks, 4 days), so although the schedule variance has increased slightly, the overall level of production is getting closer to that required to achieve completion on time.

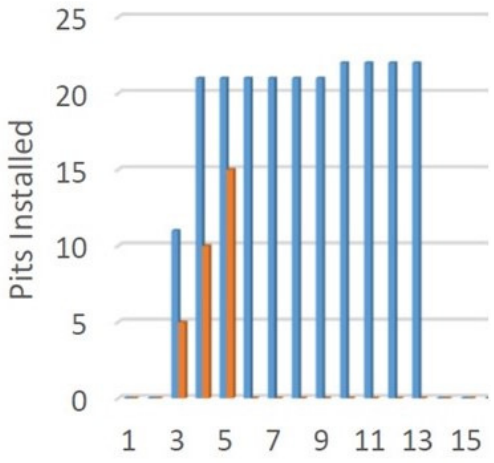
Telstra Pit Replacement

Time Now = 02-Jun-23

Planned Completion	14 Weeks	
Time Now	5 Weeks	
Time Earned	3.9048 Weeks	
Work Performance Variance	-1.0952 Weeks	(-5.5 Working Days
Work Performance Index	0.7810	
Expected Completion	17.9268 Weeks	
Variance At Completion	-3.9268 Weeks	(-27.5 Calendar Da
Expected Completion Date	**03-Sep-23**	

Note: This date is an approximation, WPM does not include a detailed calendar.

WPM Update Report



Work per Time Unit

By plotting the trends for both **WV** and **VAC** will show management how the project is tracking overall. Even where a project has a good CPM schedule in place this information is useful. CPM has a number of traits that provide overly optimistic projections of progress[5].

For more details on how the ***Easy WPM Workbook*** is set up, download the instructions for its use from: https://mosaicprojects.com.au/PDF-Gen/WPM_Instructions.pdf

The commercial spreadsheet, free sample spreadsheets, and instructions for their use can be downloaded from: https://mosaicprojects.com.au/shop-easy-WPM_WS.php

Conclusions

WPM provides a robust, simple system to measure the performance of work to date, and assess the likely project completion. Following the trends in the two key metrics shows if the project's performance is improving or deteriorating and the current expected consequences of this performance level.

The metric used in WPM can be a core deliverable (eg, 2000 computers replaced in an organization) or a representation of work such as the $ value of the components to be delivered. Peripheral and support activities can generally be ignored, they rarely impact the project delivery independently; failures in the support areas typically manifest in the primary delivery metric either immediately, or after a short time lag.

In summary, WPM is designed to provide a cost efficient, simple, rigorous controls tool for the many projects that are either:

- Relatively small requiring a straightforward controls tool, or
- Large, but with a single primary deliverable that is easy to measure, or
- Fall into the classification of agile or distributed projects where CPM has been shown to be ineffective (but choose not to apply EVM & ES)

WPM is not an alternative to EVM and CPM on major complex projects.

[5] For more on using ***WPM to augment CPM predictions*** see: https://mosaicprojects.com.au/PMKI-SCH-041.php#WPM-CPM

Try WPM on your projects:

The ***Easy WPM Workbook***, is a practical spreadsheet that performs the calculations needed to implement Work Performance Management (WPM) to accurately calculate the status and projected completion of your projects.

Download the free sample files, or buy the ***WPM Workbook*** and instructions for use for **$20** (plus GST for Australian purchasers only), from:
https://mosaicprojects.com.au/shop-easy-WPM_WS.php

Other papers in this series:

1. **WPM Overview**: https://mosaicprojects.com.au/Mag_Articles/AA037_-_Overview_of_WPM.pdf
2. **WPM solves CPM optimism**: https://mosaicprojects.com.au/Mag_Articles/AA039_-_WPM_solves_CPM_optimism.pdf
3. **WPM for Agile Projects**: https://mosaicprojects.com.au/Mag_Articles/AA040_-_WPM_for_Agile_Projects.pdf
4. **WPM for Lean & Distributed Projects**: https://mosaicprojects.com.au/Mag_Articles/AA041_-_WPM_for_Lean_+_Distributed_Projects.pdf
5. ***Easy WPM Workbook*** instructions for its use: https://mosaicprojects.com.au/PDF-Gen/WPM_Instructions.pdf

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