# Using Remaining Duration as a Key Project Performance Measurement Tool [1]

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## ABSTRACT

Inherent in any project environment that generates regular cost and schedule status updates, is a system that can measure project performance relative to the passage of time. As in the Earned Value Management System (EVMS) environment, variances and indices can be calculated and analyzed to determine project performance and data can be used to forecast cost and schedule end states; but in this second environment, performance measurement is not dependent on a construct such as a baseline. It is dependent upon remaining duration relative to the passage of time, which is absolute.

**Key Words:** baseline, forecast, cost, schedule, performance, measurement, index

## INTRODUCTION

The current industry standard project controls environment employing best practices is centered around a system in which an original plan, the baseline, is compared to its current forecast, generated via incorporation of progress to-date. Cost and schedule variances between this current update and the baseline are noted and if pre-defined thresholds are exceeded, analysis follows. Other indices are calculated using standard algorithms, from which projections are made and estimates at completion (EACs) are generated. This process is well-defined and is fully described in the ANSI EVMS Standard, ANSI/EIA-748. The complete description of that system, its indices, parameters, data interpretations, corrective actions and controls can be found in that standard and are beyond the scope of this paper. That system and the EVMS standard are referenced only to establish that in the current industry standard environment, project performance measurement is accomplished by comparing a current forecast with a baseline and its utility is therefore greatly dependent on the quality of the baseline established for the project and the forecast update.

There may be occasions in the project lifecycle when additional performance perspective is desired; for example, if the baseline and forecast scope and/or schedule have diverged and no rebaselining effort is underway, or some performance perspective is desired in a project environment where EVMS has not been implemented. In the effort to provide new or additional project performance perspective, it is recognized that in the current industry

[1] How to cite this article: Owen, W. R. (2023). Using Remaining Duration as a Key Project Performance Measurement Tool, *PM World Journal*, Vol. XII, Issue V, May.

standard EVMS environment and the default budget vs actuals methodology environment, the focus is on comparisons of inception-to-date datasets; cost and schedule data from the project start to the current status date. A new perspective would be to collect and analyze data that would allow a focus on the period from current status to the end of the project.

## DESCRIPTION OF METHOD

The purpose of this paper is to describe a simple system which could be used to measure project performance, which focuses on the current-to-project-end period and does not depend on the baseline construct, but measures performance relative to the passage of time, which is absolute. The quality of a baseline, or the lack thereof, is not a factor. As in the EVMS environment, the utility of the resulting data does depend upon the quality of the current forecast.

Any project cost and schedule reporting system that produces output on a regular basis would, in all likelihood, include the project's current forecasted completion date. The number of days between the current report's status date and the project completion date is the Remaining Duration (RD) of the project. The difference in the RDs for consecutive reports can be compared to the elapsed time between reports to obtain the number of days of progress achieved toward the completion date relative to the number of days between reports. For example, if a project had a RD of 120 days as of a March 1 report and a RD of 98 days as of the subsequent April 1 report, the RD of the project has been reduced 22 days during the 31 days that have elapsed between March 1 and April 1.

In an environment where project status reports are produced on a regular, periodic basis, the RD metric can be trended to ascertain improvement or declination in project performance. It can also be averaged, which would allow for prediction of project outcomes.

## APPLICATIONS AND CALCULATIONS

If there is a data set containing the history of RD values over many regular reporting periods (weekly, monthly, quarterly), the RD change per period can be calculated and averaged. If the project RD of the most recent report is divided by the average RD periodic change, an estimate of the number of periods remaining will result, and a project completion date can be predicted. For example, assume there is a data set containing ten consecutive months of project report data including RDs, the RD change is calculated for each period and the RD change is averaged, producing an average RD of for example, 25 days per month. If the project RD from the most recent forecast is 100 days and is divided by the average RD change value, 25, the result, 4 months, can be interpreted as the performance-based number of periods remaining for the project and adding that 4 months to the most recent report's status date will produce a predicted project completion date. This same methodology could also be used to develop predictions for interim schedule milestones.

In the foregoing example, if the project reporting dataset also includes a cost Estimate at Completion (EAC), then a performance based EAC can also be derived. As in the preceding paragraph, using subsequent reports, the performance-based number of periods remaining for the project can be calculated. Multiplying that number of periods by the average EAC change per period will produce a performance-based project cost ETC.

The numbers from the earlier paragraph discussing RD can be combined to create an index that can be used to quantify schedule performance relative to elapsed time. That ratio can be designated as the Remaining Duration Performance Index (RDPI) and its derivation is as follows:

Parameters:
n = any given project report
n+1 = the subsequent project report
dd = the data date of a project report
cd = completion date of a project report

Calculation:
Remaining Duration = $RD_x = cd_x – dd_x$
Remaining Duration Performance Index = RDPI = $(RD_n – RD_{n+1}) / (dd_{n+1} – dd_n)$

For example, if a project's forecast schedule for the period ending January 31, 2022, contained a project end date of August 27, 2024, the RD would be 939 days. If, one year later, the project's forecast schedule for the period ending January 31, 2023, contained a project end date of December 22, 2024, it's RD would be 691 days. The interpretation of the data would be that, in the one year (365 days) of elapsed time between the two forecasts, the time remaining to complete the project had been reduced by 248 days. The RDPI would be calculated as follows:

(August 27, 2024 - January 31, 2022) - (December 22, 2024 - January 31, 2023) / (January 31, 2023) - (January 31, 2022)

(939 – 691) / 365 = 248 / 365 = .679

This metric can be thought of as the ratio of project progress relative to the passage of time. If the project has progressed nearly on schedule, this ratio will be near 1.0. If the project has progressed ahead of schedule, the ratio will be greater than 1.0; and if the project has progressed behind schedule, the ratio will be less than 1.0. If the calculation produces a ratio that is less than zero, the project end date is receding faster than the passage of time and the project cannot finish if this condition persists.

**SUMMARY**

The foregoing describes a simple system by which project performance can be monitored and reported in the absence of an EVMS system or as a complement to a reporting system where EVMS has been implemented. The key parameter employed in this system is the reduction in remaining duration relative to the passage of time, making all derived values performance-based and project completion oriented. In any case, it seems intuitive that measurement of project performance relative to the passage of time is appropriate and such a system might prove useful in informing project management decisions.

## About the Author

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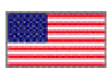

**William (Bill) Owen** has more than 30 years of experience in program/project management controls and systems, and in data processing/programming/system administration in support of large projects and programs. His special fields to expertise include Program/Project Management/Administration, Project Controls and Risk Analysis. Industries he has supported include nuclear waste management, construction, information management, insurance and finance. In addition, he has 8 years of classroom instructional experience. He holds a M.A.T. in Mathematics (1975) and a B.S. in Mathematics (1970) from Morningside College; Sioux City, Iowa, USA.

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