

Mill Clocks and Earned Schedule ¹

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Introduction

In the same way as for the early industrialization of work and formalization of labour, project management aims to make most effective and profitable use of planning and resource capabilities. As David S. Landes, states in “The Unbound Prometheus”, “The factory was more than just a larger work unit. It was a system of production resting on a characteristic definition of the functions and responsibilities of the different participants in the productive process.” That sentence could as easily describe the modern project environment.

This note takes lessons from the early days of the industrial revolution and applies them to project management.

Mill Clocks and Progress Tracking

The factory was considered as a machine, composed of individual entities acting together as parts of a larger, continuously operating mechanism with a central power source (whether water or steam) driving all machines at coordinated rates. This can be compared to the various project components that need to be coordinated and executed in accordance with a formal plan.

Some mills had a specially-devised mill clock that provided both pacing of the work and tracking of progress with respect to the plan: “Many mills have a clock turned by the mill; close to another clock regulated by a pendulum. Both are made with dials and hands exactly alike, but one has a title on the dial ‘mill time’, and the other, ‘clock time’.” (The Rees Cyclopaedia). An image of one such installation is shown in Figure 1.

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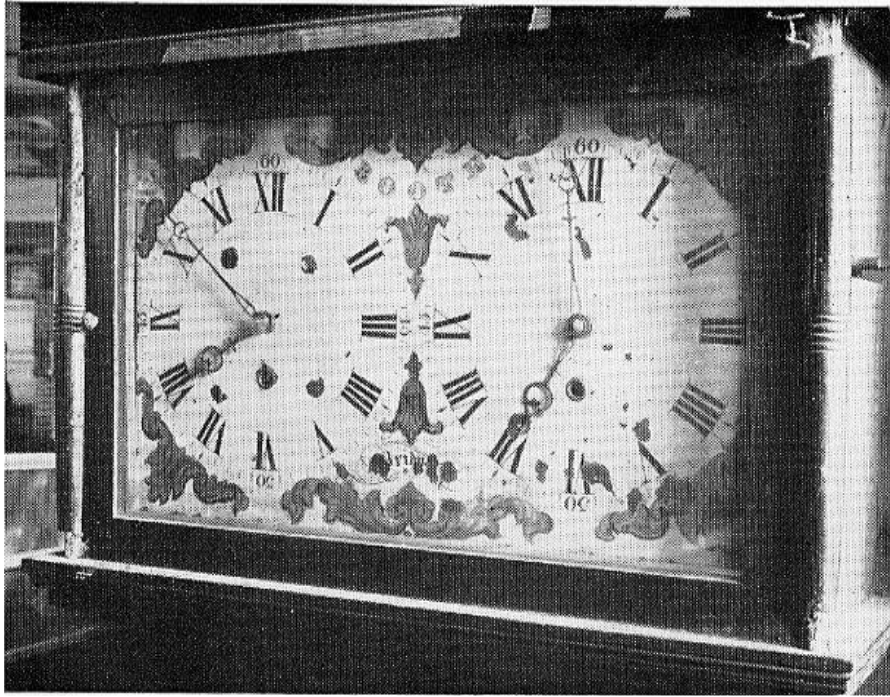


Figure 1: Analogue Earned Schedule. The clock on the left measures the current time; the one on the right corresponds to work completed.

Being driven by the power source based on the rate of the work, the hands of the mill clock therefore moved according to the amount of work carried out, whereas those of the pendulum clock measured the passing of time. The gearing of the mill clock was set to correspond to the work rate specified by the management. For an actual work rate in line with this target, the time on the mill clock would always agree with the clock time. Work therefore earned time on the mill clock, and this had to keep pace with the time shown on the pendulum clock. In a well-regulated mill, these two clocks would never vary by more than a few minutes. In the image shown in Figure 1, the mill clock (on the right) is almost one hour behind the time shown on the pendulum clock (on the left). This corresponds to a work rate that is lagging significantly behind the target set by management.

Earned Value

The Earned Value method operates in a similar way to the mill-owner in that it takes as convention that the work completed generates value and that this value at any point in time is directly related to the corresponding planned investment. If the work is completed early, the value is earned earlier, and the mill clock will be ahead of the pendulum clock. If the work is delayed or slips, the value will not be earned at the required rate, and the hands on the mill clock will go slower. In Earned Value terms, the earned value in this case is therefore less than the planned value represented by the value given by the project's cumulative cost curve for that point in time.

This two-clock system provides a clear and simple representation of the relationship between Earned Schedule (the millworker's view of the mill clock), Earned Value (the

management view of the mill clock), and the target on the pendulum clock which can be considered both as Planned Schedule (by the millworkers) and Planned Value (by management). However, in the mill, as opposed to the normal project environment, the required work-rate and corresponding rate of value acquisition will be uniform.

Discussion: from Work to Value to Benefits

The mill clock vs. Earned Value

Tracking progress in this way in the mill is considerably simpler than in general projects. Whereas value in the mill increases linearly over time, with the Earned Value Method, the value increases at varying rates corresponding to the agreed investment rate at a given point in time.

A contemporary version of the mill clock approach could therefore be provided by a “bill clock” device. The device would show two scales. The scale on the left would show the current date (“calendar date”) whereas the right-hand scale, the “bill clock”, would move forward based in the budgeted cost of the work performed. In the same way as for the mill clock, the bill clock device would provide a visual representation of progress with respect to the plan – that is to say, a dynamic view of the ongoing earned schedule.

Earned Value vs. Benefit Realization

Although the bill clock approach, if it could be implemented, would be more applicable to modern projects than the mill clock approach, it includes a simplification that dates back to the mill clock era and is still present in the Earned Value and Earned Schedule methods. This is the assumption that the value earned by the project at any point in time increases in according to the budgeted cost of completed work. However, the reason for undertaking a project is not to spend a budget. The goal is to deliver a benefit. A simple change to the current techniques can take this need into account.

Earned Benefit-Value

Conceptually, planning and tracking project progress with respect to the project’s benefit realization target could be provided by an additional extension of the original mill clock approach. This device would include a “fulfil calendar” as the right-hand scale which moves forward based on the actual benefit contribution rate, with the left-hand scale showing the current calendar date.

This enhancement to the currently used progress-tracking techniques for projects is not actually available as a mechanical device. However, it does exist as a fully developed technique. The detailed approach and the algorithms for implementing this “Earned Benefit-Value” method in software can be found in the following article:

Piney, C. (2019). Benefits for Projects: Adding a benefits dimension to the Earned Value Method, Series on Applying Earned Benefit Management, PM World Journal, Vol. VIII, Issue III (April). <https://pmworldlibrary.net/wp-content/uploads/2019/03/pmwi80-Apr2019-Piney-Benefits-series-part-10-Benefits-for-Projects.pdf>

About the Author



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After many years of managing international IT projects within large corporations, **Crispin (“Kik”) Piney**, B.Sc., PgMP is now a freelance project management consultant based in the South of France. At present, his main areas of focus are risk management, integrated Portfolio, Program and Project management, scope management and organizational maturity, as well as time and cost control. He has developed advanced training courses on these topics, which he delivers in English and in French to international audiences from various industries. In the consultancy area, he has developed and delivered a practical project management maturity analysis and action-planning consultancy package.

Kik has carried out work for PMI on the first Edition of the Organizational Project Management Maturity Model (*OPM3™*) as well as participating actively in fourth edition of the *Guide to the Project Management Body of Knowledge* and was also vice-chairman of the Translation Verification Committee for the Third Edition. He was a significant contributor to the second edition of both PMI’s Standard for Program Management as well as the Standard for Portfolio Management. In 2008, he was the first person in France to receive PMI’s PgMP® credential; he was also the first recipient in France of the PfMP® credential. He is co-author of PMI’s *Practice Standard for Risk Management*. He collaborates with David Hillson (the “Risk Doctor”) by translating his monthly risk briefings into French. He has presented at a number of recent PMI conferences and published formal papers.

Kik Piney is the author of the book [*Earned Benefit Program Management, Aligning, Realizing and Sustaining Strategy*](#), published by CRC Press in 2018

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