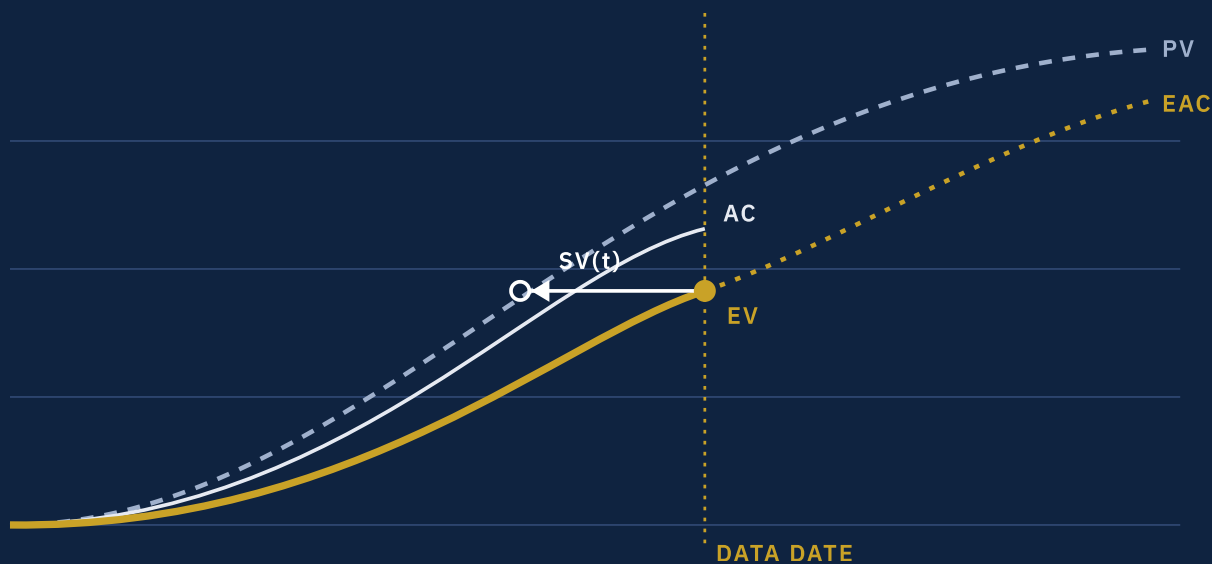




Earned Value & Earned Time

The Practitioner's Manual for Cost and
Schedule Performance



EVM · EARNED SCHEDULE · EARNED TIME MANAGEMENT (ETM)
DASHBOARDS · AI · **FOR EVERY INDUSTRY**



Earned Value & Earned Time: The Practitioner's Manual for Cost and Schedule Performance

First Edition, 2026

Written by the P6 Project Controls Team

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Names and methods. Software and product names in this manual are used only to identify the tools practitioners work with, and remain the property of their owners. The methods, terms and procedures described reflect common industry practice.

The sandbox projects. The six sandbox projects and the program used throughout this manual are fictional teaching cases.

Disclaimer. This manual describes professional practice. It is not legal, contractual or financial advice. Contract terms, owner specifications and applicable standards always take precedence over the methods described here.

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FRONT MATTER

Foreword

Every project controls professional has sat through a status meeting where the numbers were right and the message was wrong. The cost report balanced. The S-curve climbed. The performance indices sat close to 1.0. And six months later the finish date moved, and everyone asked why nobody had seen it coming.

We wrote this manual because, in most of those meetings, the warning was already in the data. It was in the schedule, on one chain of work, measured in days. It just was not in the numbers anyone was reading.

Earned Value Management is one of the most valuable tools our profession has. It ties scope, cost and time into one honest picture, and nothing in this book replaces it. But EVM speaks in currency, and the finish date does not. So this manual does three things. It teaches EVM the way it works in practice, inside Primavera P6, on real-sized projects. It adds Earned Schedule, which turns cost performance back into time. And it introduces Earned Time Management, which measures progress in days along the paths that actually decide the finish.

The methods are shown on six sandbox projects from six industries: a data center, a federal renovation, a rail extension, an airport terminal, a water program and an ERP rollout. They are fictional, but they behave the way real schedules behave. They slip on the paths with the most float. They earn money off the critical path. They report green while the finish date drifts.

This is a working manual. Each technical chapter opens with a field scene, explains the method, works it on a sandbox, shows the P6 steps, names the traps, and closes with a checklist you can use on Monday morning. Use the parts you need. Argue with the parts you disagree with. And when the next status meeting tells you everything is fine, check the paths.

P6 Project Controls

RECOGNIZED CPM SCHEDULING EXPERTS



13

Earned Time Management (ETM)

Earned Time Management (ETM) measures progress in days, follows the logic of the network, and tells you which path is losing time and how much. By the end of this chapter you will be able to calculate Earned Time for a task, a lag, a group of parallel tasks and a full path, read a path's time-based SPI, and turn it into a finish-date forecast that a project manager can act on.

IN THIS CHAPTER

1. The month SPI said 0.98
2. Why time needs its own earned measure
3. From one task to a whole path
4. The five-step ETM procedure
5. The P6 Project Controls layer
6. The steel workshop finishes path
7. Getting ETM out of an update

FIELD SCENE

The month SPI said 0.98

The monthly review on the commuter rail extension (sandbox RL-03) opened the way most of them do. The cost report was on the screen, the S-curve looked tidy, and the schedule performance index sat at 0.98. The contractor's project manager called it "basically on plan." Nobody in the room argued.

I had the P6 update open on my laptop, and it told a different story. The station box excavation, the work that drives the tunnel boring machine launch, had earned barely half the time it should have. What kept the index healthy was a large, cost-heavy batch of utility relocations finished early on a path with 60 days of float. Money was being earned; time on the critical path was not.

I asked one question: "How many days of work has the launch path earned since the last update?" The answer, once we worked it out, was 19 days of progress over 30 calendar days. That is a time-based SPI of 0.63 on the path that sets the finish date. Three months later the launch slipped by seven weeks, almost exactly what that path's rate had been predicting.

That meeting is why this chapter exists. A cost-weighted index blends every dollar on the project into one number. The finish date is not decided by every dollar. It is decided by one chain of work, and you need a measure that looks at that chain in the unit it is judged in: days.

Why time needs its own earned measure

Chapter 11 showed three ways the classic SPI misleads. It is weighted by cost, so expensive work drowns out cheap but critical work. It ignores logic, so out-of-sequence progress counts as fully as work done in order. And it is forced to 1.0 at completion, so a job that finishes a year late still closes with a "perfect" index.

Earned Schedule (Chapter 12) fixed the third problem by translating earned value back into time. It answers "how far along the baseline curve have we really come?" and gives SPI(t) and SV(t) in months or weeks. That is a large step forward, and it should be on every dashboard. But Earned Schedule still reads the project through one cost curve. It does not know which work sits on the critical path.

Earned Time Management (ETM) starts from the other end. Instead of converting dollars into time, it measures time directly from the schedule: planned durations, percent complete and lags. It then adds those days up the way the network adds them up, along paths, so the result can be read path by path.

ETM is an emerging practitioner method, not yet a published standard. Its building blocks, earned duration and path-based performance, have been discussed for years in scheduling and Earned Schedule circles. This chapter presents the method as it is used in practice and layers the P6 Project Controls review approach on top of it. Treat it as a strong complement to EVM and Earned Schedule, not a replacement.

Question	EVM (SPI)	Earned Schedule (SPI(t))	Earned Time Management (ETM)
Unit of measure	Currency	Time, derived from cost	Time, from durations
Needs cost-loading	Yes	Yes	No
Sees the critical path	No	No, unless applied to path subsets	Yes, by design
Converges to 1.0 at finish	Yes	No	No
Best use	Cost efficiency, funding	Project-level time trend	Path health and finish forecast

The method: from one task to a whole path

ETM uses four building blocks. Each one is earned in working days on the activity's own calendar.

1. Task Earned Time. A task earns the share of its planned duration that matches its progress.

$$ET_{\text{task}} = PD_{\text{task}} \times \%C_{\text{task}}$$

PD is the baseline (planned) duration and %C is the physical or duration percent complete. A 10-day task at 40% has earned 4 days. Completed tasks earn their full planned duration, however long they actually took.

2. Lag Earned Time. A lag is time the plan says must pass, so it earns time as it passes. It earns the elapsed working days since its trigger, capped at its length. Once the successor has started, the lag is fully earned. Ignoring lags understates progress on any path with curing, review or approval periods.

3. Subnet Earned Time. Where work splits into parallel branches and joins again, the branches are not added together. The subnet earns what its longest earned branch has earned, because that branch is what has actually moved the path forward.

$$ET_{\text{subnet}} = \max(\text{ET}_{\text{branch 1}}, \text{ET}_{\text{branch 2}}, \dots)$$

WATCH OUT

P6 stores lags in hours and applies them on the calendar chosen in the scheduling options: predecessor, successor, 24-hour or project default. A 40-hour lag is 5 days on an 8-hour calendar but less than 2 days on a 24-hour one.

4. Path Earned Time. Along a path, earned time adds up in sequence: tasks, lags and subnets.

$$ET_{\text{path}} = \sum ET_{\text{task}} + \sum ET_{\text{lag}} + \sum ET_{\text{subnet}}$$

Two time-based indicators come from these figures. Actual Time (AT) is the working time elapsed from the path's actual start to the data date.

$$SV_{\text{ETM}} = ET_{\text{path}} - AT_{\text{path}} \quad SPI_{\text{ETM}} = \frac{ET_{\text{path}}}{AT_{\text{path}}}$$

A negative SV is days lost. An SPI of 0.91 means the path is earning 0.91 days of planned work for every working day that passes. The forecast follows directly. With PD_{path} as the planned duration of the whole path, the remaining work is PD_{path} – ET_{path}, and it will take that long divided by SPI.

$$\text{Forecast duration}_{\text{path}} = \text{AT}_{\text{path}} + \frac{\text{PD}_{\text{path}} - \text{ET}_{\text{path}}}{\text{SPI}_{\text{ETM}}}$$

A hand example. Picture a short path. Task P (8 days) is complete. It is followed by two parallel branches: task Q (6 days) is complete, while a 4-day lag leads into task R (10 days), now 50% done. Both branches feed task S (10 days), which is 30% done. The data date is 22 working days after P started.

Element	Planned (days)	Progress	Earned (days)	
Task P		8	100%	8
Branch 1: Q		6	100%	6
Branch 2: lag + R	4 + 10 = 14	lag done, R 50%	4 + 5 = 9	
Subnet (longest branch)	14	—	max(6, 9) = 9	
Task S		10	30%	3
Path	32	—		20

So ET = 20 days against AT = 22 days. SV(ETM) = –2 days and SPI(ETM) = 20 ÷ 22 = 0.91. At that rate, the remaining 12 days of planned work will take about 13.2 working days. The path is forecast to finish in about 35.2 days against a plan of 32: a slip of just over 3 days, visible today.

The five-step ETM procedure

Run these steps at every status update, after the schedule has been progressed and recalculated.

1. **Score every task.** Calculate ET, SV and SPI for each started or completed task, and for each lag.
2. **Score every path.** Roll the tasks up along each path, applying the subnet rule at every split and join.
3. **Read the driving path first.** Take the metrics of the longest path. That is the one that sets the finish date.
4. **Check the near-critical paths for float erosion.** Compare each path's forecast slip with its remaining total float. A path whose float is being consumed faster than it earns time is the next critical path.
5. **Evaluate and forecast.** Turn the path SPIs into forecast finish dates, compare them with the contract milestones, and decide what to escalate.

The P6 Project Controls layer

The five steps produce numbers. These five habits turn them into decisions, and we apply them on every engagement.

- **Rank paths, don't pick one.** Use P6's multiple float path calculation to list the top 5 to 10 paths to the key milestone. Score them all. The path that matters next month is often number three today.

- **Use fixed thresholds.** SPI(ETM) of 0.95 or above is green, 0.85 to 0.95 is amber, and below 0.85 is red. Fixed bands stop debate about whether 0.89 is "close enough."
- **Set a float-erosion trigger.** Flag any path whose forecast slip leaves it with fewer than 10 working days of float. Agree that number with the owner at the start of the job.
- **Watch the gap between cost and time.** When the cost SPI and the driving path's SPI(ETM) differ by more than 0.10, someone is earning money off the critical path. That is the field scene in this chapter, and it is almost always worth a conversation.
- **Trend over three updates.** One bad month is noise. Three months of a falling path SPI is a pattern, and the forecast should be treated as the likely outcome.

Worked example: the steel workshop finishes path

The result first: the path with the most float is the one that will finish last, and a single group SPI of 0.96 hides it. The example uses the steel workshop workbench from Appendix D, a pre-engineered steel workshop with a short finishes sequence in the main building.

The network. Masonry starts the sequence. Plastering may start 15 working days after masonry starts (a start-to-start lag). When plastering is complete, three branches run in parallel, and all three must finish before doors and windows can be installed:

- **Branch A, wet finishes:** thermal and moisture protection (7 days), then wall tiles (20), then floor tiles (20). Total 47 days.
- **Branch B, dry finishes:** gypsum board (7), then painting (30). Total 37 days.
- **Branch C, envelope:** façade finishing (30). Total 30 days.

The planned path through branch A is $15 + 30 + 47 + 10 = 102$ working days, so A is the critical branch. Branch B has 10 days of float and branch C has 17.

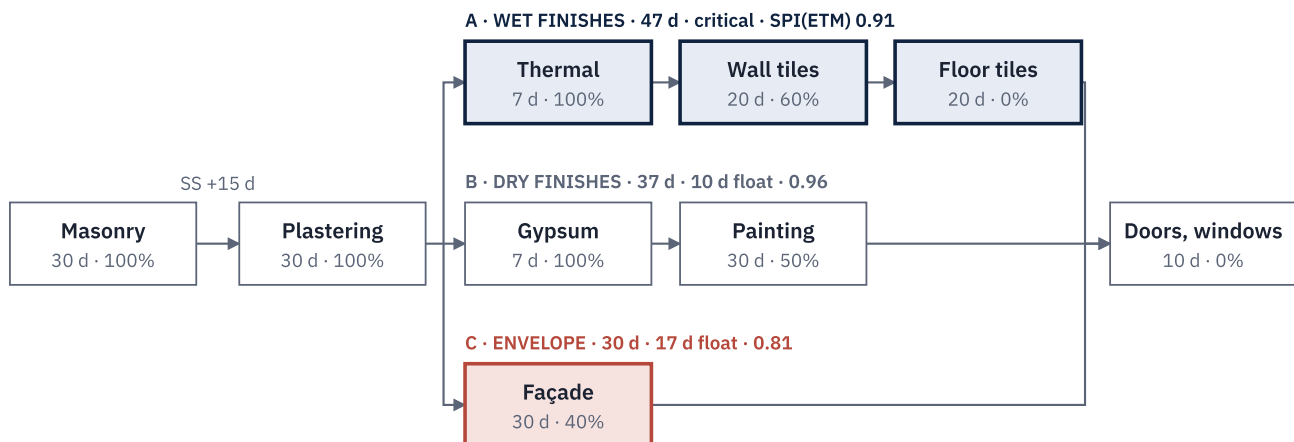


Figure 13.1 · Steel workshop finishes network at working day 70. Branch A (navy) drives the finish; branch C (red) starts with the most float but earns time slowest.

Blue marks the critical branch A. Red marks branch C, which starts with the most float but is earning time slowest.

The status. The data date is working day 70, counted from the start of masonry. Masonry and plastering are complete, so the 15-day lag is fully earned.

Element	Planned (days)	% complete	Earned Time (days)
SS lag, masonry to plastering	15	elapsed	15
Plastering	30	100%	30
A: thermal and moisture	7	100%	7
A: wall tiles	20	60%	12
A: floor tiles	20	0%	0
B: gypsum board	7	100%	7
B: painting	30	50%	15
C: façade finishing	30	40%	12
Doors and windows	10	0%	0

Step 2: score every path. Each branch defines its own path from the masonry start to doors and windows. AT is 70 days for all three.

Path	Planned (days)	Total float	ET (days)	SV (days)	SPI(ETM)	Forecast (days)	Forecast float
A, wet finishes	102	0	64	-6	0.91 (amber)	111.6	-9.6
B, dry finishes	92	10	67	-3	0.96 (green)	96.1	5.9
C, envelope	85	17	57	-13	0.81 (red)	104.4	-2.4

Forecast duration = $70 + (\text{planned} - \text{ET}) \div \text{SPI}$. Forecast float = $102 - \text{forecast duration}$.

Steps 3 to 5: read, check and forecast.

- **The driving path is late.** Path A has earned 64 days in 70 and is forecast to finish about 10 working days late.
- **The float path is the real risk.** Path C started with 17 days of float, the most of any branch. At an SPI of 0.81 it burns through all of it and is forecast to finish at day 104.4, past the planned finish of day 102. It has become a second critical path. Without per-path ETM, C stays invisible until it goes critical.
- **Path B trips the trigger.** It is green today, but its forecast leaves only 5.9 days of float, below the 10-day trigger. It goes on the watch list.

What the subnet rule would have shown. Rolled up as a single group, the subnet earns its longest earned branch, which is B at 22 days. The group ET is $15 + 30 + 22 = 67$ days and the group SPI is 0.96, comfortably green. The roll-up is right for a summary, but it reported the healthiest branch, not the critical one. That is why step 3 reads the driving path first, and why step 4 checks every near-critical path on its own.

END OF FREE PREVIEW



Continue reading the full edition

You have read the opening of Chapter 13. The full manual carries the method through float erosion, enterprise roll-ups, risk calibration, dashboards and AI, with every number worked on six sandbox projects.

STILL TO COME

- The decision on the steel workshop, and getting ETM out of a P6 update
- EAC ranges, TCPI and variance reports that lead to action
- Earned Schedule worked from P6 data
- Float erosion and the next critical path
- Monte Carlo calibrated with SPI(ETM)
- DCMA, BEI, CPLI and the out-of-sequence trap

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