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BUILDING DECISION RUNWAY: FROM BACKWARD VARIANCE TO FORWARD CONTROL

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EXECUTIVE SUMMARY

When decisions rely on variances to a static plan, critical issues often surface too late. A dynamic redistribution model shifts the lens forward creating clear, understandable forecasting—exposing early warning signs and enabling rapid, focused intervention.

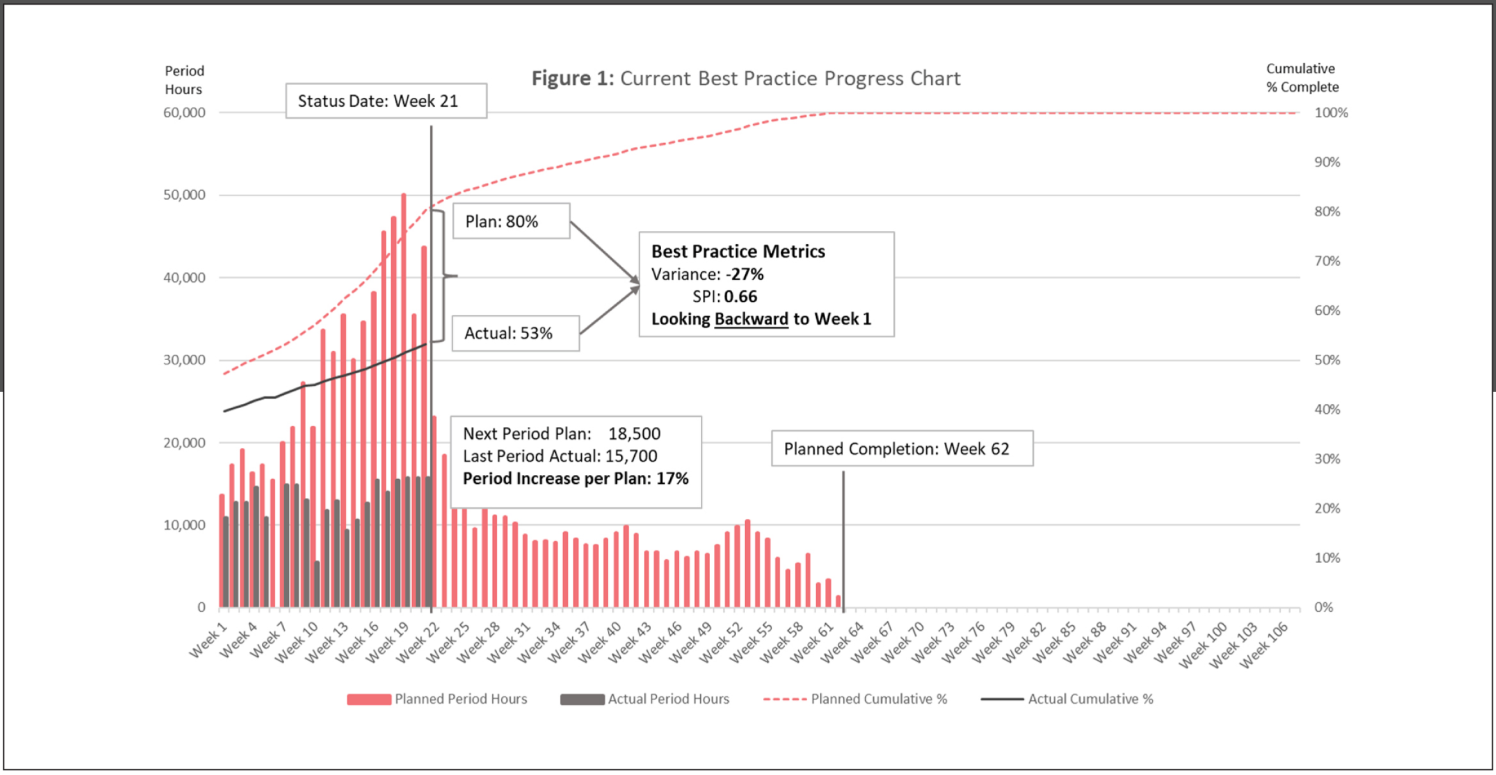
Schedule Assurance Against Yesterday's Reality

Today, project progress is often assured by comparing actuals against a fixed baseline using variances and the schedule performance index (SPI). This assumes the baseline is still valid and that deviations provide early warning.

Tools like P6, MS Project, and production control are designed for project and crew planning, but assurance that progress pace supports objectives is another matter. They establish a path, yet that path is a poor predictor of speed. Waiting for variances to become alarming delays responses, costs opportunities, and erodes trust. Leaders end up explaining outcomes instead of influencing them. Without real-time, interactive redistribution, the gap between reported metrics and field reality widens until performance shortfalls are unmanageable.

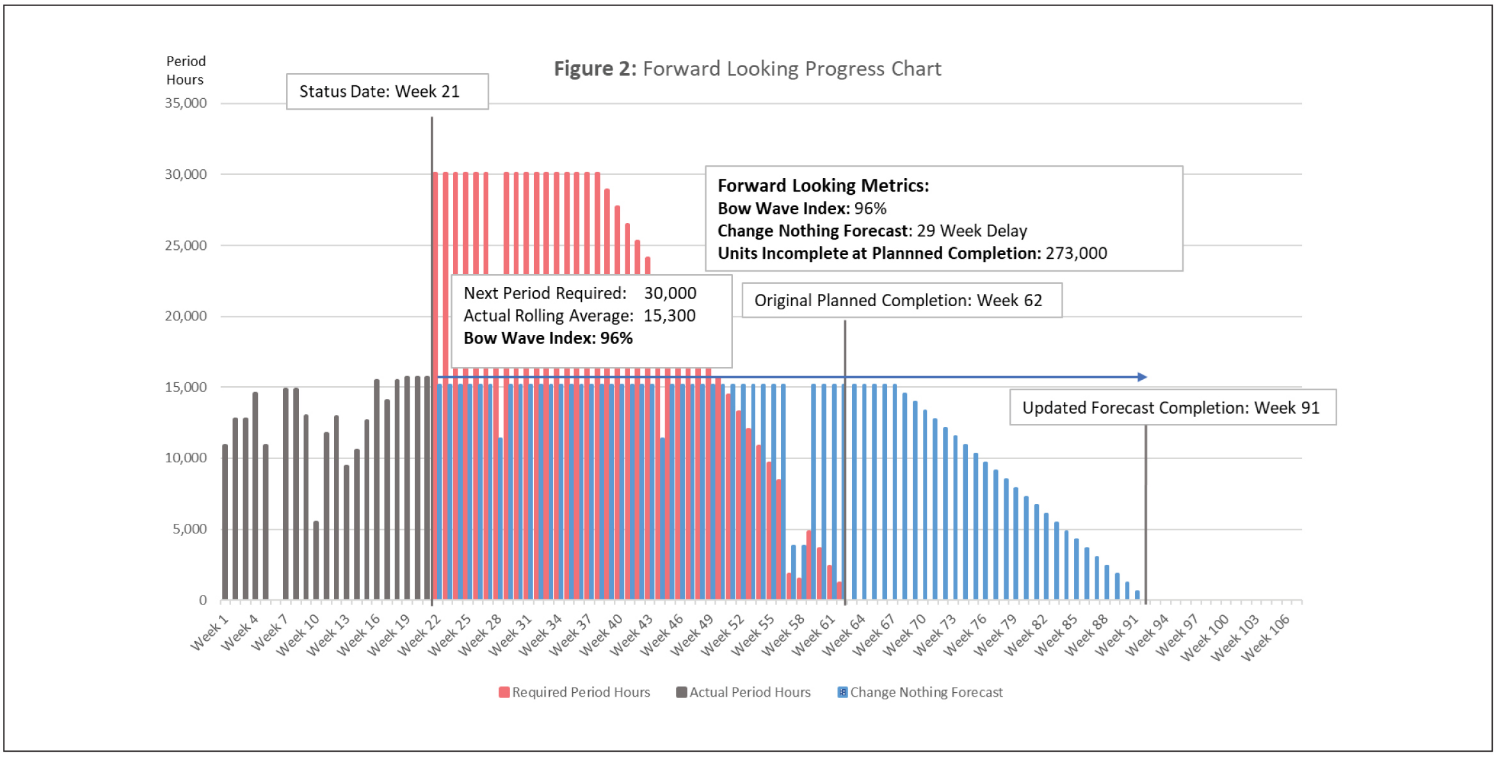
Progress Charts-Visual Representation of the Schedule

Figure 1 below is indicative of the best practice schedule accountability progress chart. A version of this format is used on the majority of capital projects today. It focuses on the variance to the plan and the SPI.



The planned bars, in light red, are included throughout the execution phase with the only week-to-week change being the input of the past week's actuals, as indicated in grey.

Figure 2 shows a dynamically redistributed progress chart assuring schedule progress to the commitments. The original period plan bars are removed, and the remaining work is redistributed forward of the status date, as indicated in light red.



In the best-practice chart (Figure 1), the planned period shows 18,500 hours. After redistribution, the true requirement for the next period is 30,000 hours as this value changes with each reporting cutoff.

Active redistribution then reveals an updated forecast: based on the current progress of 15,300 hours, the project is tracking toward a 29-week delay if no corrective action is taken. It also highlights the volume of work that will remain incomplete at the planned finish date—273,000 hours in this case, the sum of the period blue bars after the original plan date. This metric is especially critical when work must shift locations on a fixed date.

What is absent here is a reference to the original plan. Why? Beyond the target completion date and the remaining quantities to complete, all other data is secondary and often misleading.

WHY STATIC BASELINES FAIL MODERN PROJECTS

The Baseline Paradox

Measuring progress against a fixed baseline is a legacy of more predictable project environments. However, today's projects shift too quickly for static plans to remain relevant. This dilemma creates reporting that looks consistent but lacks actionable value, thus delaying the early decisions modern projects urgently need.

The Baseline Trap

When all attention is spent tracking variance, there's little room to improve the plan. The current model treats deviation as failure rather than feedback. This suppresses course correction in favor of reporting alignment. Instead, we should treat the baseline as the invitation to begin work but once the project has started, the go-forward view should be our focus. Redistributed progress is the assurance to maintaining the plan.

The False Security of Overall Metrics

The use of an index, such as SPI, is designed as a high level overall project indicator but is not meant to be used as a management tool. As Eliyahu Goldratt states in The Goal: "A system's throughput is always constrained by its slowest point. The trick isn't to fight bottlenecks—it's to see them, manage to them, and optimize around them." While an overall metric might look good, the project still needs to identify these bottlenecks as indicated by a bow wave of unearned work.

WHY COMMON SOLUTIONS FALL SHORT

CPM Float Analysis

One common approach is to combine SPI and plan variance metrics with Critical Path Method (CPM) float analysis. This lets teams distinguish between delays on critical paths and those with float, helping direct attention to high-risk areas. If an activity is behind schedule but not on the critical path, it may be deprioritized.

However, CPM float is a moving target and increasingly unreliable as projects evolve. All too often, float reflects contractual positioning rather than project reality. Basing decisions on these numbers risks misprioritizing effort, allowing genuine bow waves to go unnoticed.

Manual Replanning

A potential alternative is to treat each status date as the starting point for a mini-replanning effort. Planners then generate updated curves for the remaining work, using the latest data and what-if assumptions. These redistributed progress curves can reveal early signs of deviation—but the process is time-consuming and does not allow rapid scenario generation, taking 3-4 weeks to complete a single replanning exercise.

This timeline simply doesn't align with the weekly or biweekly cadence of modern project reporting. By the time the revised curves are completed, the status has already changed—leaving the team constantly behind. Even if this is completed, the static nature of the outputs will become irrelevant almost immediately.

THE SOLUTION

Forward Redistribution and Bow Wave Detection

To keep in front of potential issues, the clearest solution is to continuously redistribute the remaining hours and quantities in front of the status date, comparing this to the actual performance and quickly identifying any bow waves. This method also should incorporate the swapping of key project variables such as scope growth, future events such as weather or holidays. Using continuous redistribution coupled with variable swapping provides a vastly superior project warning system for decision makers.

This solution is not reliant on the current plan being identical to the baseline plan. A go-forward redistribution and bow wave detection allows the freedom to incorporate any project adaptations, without being tethered to the baseline.

As stated in How Big Things Get Done by Bent Flyvbjerg and Dan Gardner, "For fat tailed risk, which is present in most projects, forget about forecasting risk, go directly to mitigation by spotting and eliminating dangers." The bow wave approach helps drive the team to rapid mitigation.

THREE KEY ADVANTAGES OF THE FORWARD REDISTRIBUTION METHOD

Advantage 01: Rapid Scenario Generation

The current schedule assurance practices are very time consuming to generate what-if scenarios from. By shifting focus to the forward required progress, the core of the plan can be made to move in and out, interactively. This fluidity allows the decision maker to see the outcome of changing nothing by equalizing the current actuals and the future required. The decision maker can then add in variables to test different eventualities. Instead of a week for a single what-if scenario, multiple scenarios can be workshopped in minutes.

Todd R. Zabelle in Built to Fail notes: "But equally important, the typical project controls report does not indicate what is wrong other than that they are not on plan. It does not say what to go do about it." Using the interactivity and key parameter replacements, the decision maker can now see what to do about the bow wave.

Advantage 02: Production-Based Decision Making

Connecting an action to a plan variance or SPI index can be a leap of faith and usually happens much too late. As shown in Figure 2, project stakeholders can now see graphically exactly where the project, sub-project or activity is going to end up given no changes to the rate of production output. They also see what production is required to meet the current date commitments. This brings the decision onto the solid ground of production, not variances. With a production based view, bow waves clearly indicate criticality.

By dynamically redistributing remaining work via interactively moving the completion date, the plan is constantly being iterated to understand the current truth.

Advantage 03: Separation of Scheduling from Schedule Assurance

A schedule tool such as P6 is designed to provide a clear picture of the go forward map of the project, from the current status date to completion. Using the schedule as an assurance on itself can create a false sense of plan assurance as it is a closed loop.

In Figure 1, the schedule behind the chart was rated highly by a third-party quality review. Yet when run through a production-based redistribution system, that quality score did not translate into an achievable plan. Logical quality is useful—it ensures the schedule is structured and readable—but it does not capture the production performance needed to actually deliver the dates.

REAL-WORLD SUCCESS STORIES

Early Detection Saves Millions

A third-party stakeholder recently questioned the reliability of a project schedule and its progress reporting, even though it had just been assured by an external firm. When the schedule and reports were tested in a production-based, interactive redistribution system, the result was clear: the project was actually nine months behind. This early visibility prompted corrective action that ultimately saved the stakeholder significant capital.

Immediate Recognition of Reality:
A major EPC contractor believed they had a handle on the pile driving, despite a late start and some minor schedule variances. When the program was pulled into a production based, continuous redistribution system, the team clearly saw a 3-month bust. The average production was 14 piles per rig and the required was 21, much to their shock. The 14 was extended out to show a 3-month slip. Easily tracing the current situation to a “change nothing” outcome. The team acted immediately and hired a sub-contractor pile driving company to fill in the gaps, saving millions in liquidated damages.

Clear ROI on Interventions:
An owner’s team was debating a $5 million worker incentive program. Initially, the proposal was rejected. However, when a production-based redistribution view revealed that not implementing the program would result in $60 million of additional project costs, leadership reconsidered. The program was approved, and the projected $60 million cost exposure was eliminated—bringing the net impact to $0.

Preventing Cascading Failures:
At a large LNG module yard, Train 1 foundations were slated to support Train 2 modules. While schedule reports showed a negative variance, the contractor assured the client they would catch up and deliver Train 2 on time—the charts even showed the actual line converging with the plan at completion. But when the project was analyzed through a production-based redistribution view, the reality emerged: performance would need to triple. This prompted the owner to authorize a second yard, allowing concurrent work on both trains and ultimately delivering Train 2 on schedule.

Conclusion: Closing the Window on Risk

In How Big Things Get Done, the authors state: "Good planning boosts the odds of a quick, effective delivery. Keeping the window on risks small and closing it as soon as possible.

Production-based redistribution does exactly that. It identifies bow waves as they begin to form, giving project leaders the runway to mitigate risk before it compounds into lost opportunity costs. Where static metrics like variances and indexes merely describe what has already gone wrong, redistribution provides an early-warning system and a clear path to act while recovery is still possible.

About the Author

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Sources

Flyvbjerg, Bent, and Dan Gardner. How Big Things Get Done. Crown Currency, 2023.

Goldratt, Eliyahu M. The Goal: A Process of Ongoing Improvement. North River Press, 1984.

Zabelle, Todd R. Built to Fail. Project Management Institute, 2022.