

Building Great Project Schedules with S1 // S5

Book 2: Optimizing Your Schedule, Gaining Team Buy-in, and Forecasting Costs

By now, you and your schedule have come a long way. [Creating, Critiquing, and Risk-Adjusting Your Schedule](#) showed how the S1 // S5 schedule maturity framework process can help you go well beyond the capabilities of standard critical path methodology (CPM) tools by building a realistic, achievable schedule, one that [has been critiqued and adjusted to reduce risk](#). In this book, we [turn our focus to the ways](#) that S1 // S5 helps you elevate your schedule to best-in-show status by optimizing your project to keep eager stakeholders happy, gaining team buy-in, and forecasting costs. Let's get right to it.



TABLE OF CONTENTS

- 2** Chapter 1: Optimization
- 4** Chapter 2: S5—Gaining Team Buy-In
- 5** Chapter 3: The Bigger Picture: Cost Forecasting
- 7** Chapter 4: Realistic, Achievable Schedules = Successful Projects



Chapter 1: Optimization

You've built an S3 P75 risk-adjusted schedule, and even with all the improvements, your original three-year forecast has jumped to three-and-a-half years.

But with S1 // S5, you have a solution at your fingertips: exploring alternate scenarios that better align with your original forecast. Alternate scenarios might entail accelerating parts of the schedule to regain some of the time lost to risk and uncertainty, adding resources, and/or conducting more work in parallel. You can also set a new goal and determine whether it's possible to achieve it (or at least move closer).

GOAL-BASED SCHEDULE ACCELERATION

Before you report the S3 completion date to stakeholders, who may have built their expectations around the S1 date, leverage S1 // S5 goal-based schedule acceleration to ensure that your schedule is realistic, aligns better with stakeholder expectations, and will be executed successfully. It goes beyond standard CPM tool techniques by conducting multiple CPM analyses in the form of a simulation that incrementally adjusts pinpointed activities based on criteria.

This technique is powerful because:

- » It uses CPM analysis to schedule the project, which means it's true to the widely accepted and globally used technique for scheduling.
- » It uses criteria that project team members define to make informed decisions about the best activities to accelerate.

The technique's three steps are:

1. **Setting the goal:** The goal might focus on the entire project, such as accelerating the project by 10 percent, or a particular activity or milestone, such as accelerating project sanction by three months.
2. **Establishing criteria:** The simulation must follow your criteria when attempting to accelerate the schedule. Criteria define:
 - » **The action:** The change to be applied during the acceleration. Examples include:
 - Reducing activity duration by up to 20 percent.
 - Changing the activity calendar from a five-day to a six-day work week.
 - Reducing lags by up to 50 percent.
 - Removing constraints to determine the impact of a more free-flowing schedule.
 - » **The target set:** The activity or groups of activities to which the rule should apply, such as reducing engineering durations by up to 10 percent with the exception of mechanical engineering.
 - » **The priority:** The simulation inherently emphasizes activities on or near the critical path. A project is driven by its critical or longest path, so only activities on this path drive completion. The action and target set pinpoint critical path activities where the acceleration should be aimed, and how. Prioritization lets you specify activities to target first. You have several options:
 - **Earliest first** focuses acceleration on early activities, resulting in a front-end-loaded acceleration scenario.
 - **Latest first** focuses on back-end activities.
 - **Longest duration first** gives initial attention to activities with the longest duration.
 - **Easiest first** tackles the best acceleration candidates first—activities with the fewest concurrent work faces.

3. **Generating the scenario:** A simulation consists of hundreds or thousands of CPM analysis runs, and each iteration applies one or more criteria. With each iteration, the schedule accelerates incrementally until the goal is reached (or not, if the goal is too aggressive using your criteria). The resulting scenario, as depicted in Figure 1-1, can be used as decision support in tactical and strategic discussions about acceleration. Your scenario will answer such questions as how to support a three-month acceleration and whether to incentivize a contractor to meet a stretch goal.

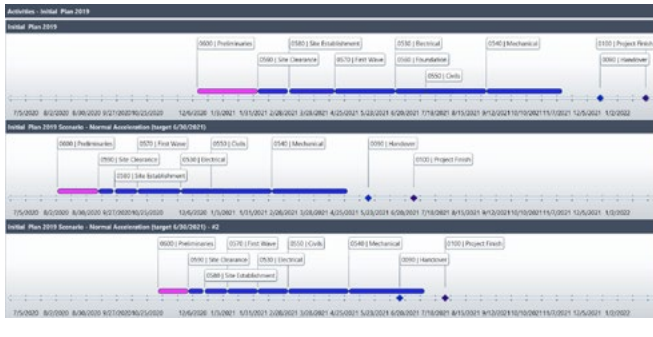


Figure 1-1: Two accelerated scenarios

The Benefit of Goal-Based Acceleration

Goal-based acceleration generates a scenario in mere seconds. Done manually, it takes days or weeks. Skeptics will be pleased that the technique doesn't eliminate the planner's expertise. The automated process frees up the planner to analyze results and make highly informed decisions about which scenario to adopt.



When to Carry out Acceleration

Projects tend to have more than one basis (think of a basis as a viewpoint or perception):

- » The **project basis** (sometimes called a baseline) is the agreed-upon schedule that forecasts when key milestones will be completed.
- » The **actual basis** is the status schedule that reflects the reality of an in-progress project. It accounts for historical completions, actual progress and delays, and changes to the original schedule. Comparing the differences between the project basis and actual basis helps us track and understand project performance.
- » The various types of **management bases**, or target schedules, are often driven by commercial or strategic factors such as time to market, investor requirements, and management's desired completion date.

Rare is the project for which the project, actual, and management basis are completely aligned. In a way, that means a project has three schedules. The more these schedules are out of alignment, the more the project may be perceived as slipping.

Goal-based schedule acceleration is ideal for aligning these bases. Typical use cases include:

- » Aligning a project basis to fit a management-defined completion date that will bring the project online sooner to reap operational revenue earlier.
- » Realigning a project that has been delayed in execution to the project basis.
- » Achieving schedule alignment with industry standards to make it competitive.

Faster Completion, but at What Price?

Another benefit of goal-based acceleration is better understanding of the acceleration/risk benefit. Acceleration often comes with a price, so it's very valuable to determine how acceleration changes risk exposure.

Consider Figure 1-2. Goal-based acceleration was applied to a project with a December 2021 completion date. A previous risk analysis showed a P50 date of March 2022, a three-month risk exposure. Project investors wanted to look at faster alternatives, and goal-based acceleration yielded a completion date of December 2020, 12 months earlier than the original date. A subsequent risk analysis showed a P50 date of May 2021, an increase in risk exposure from three to five months.

The project investors learned that despite the increased risk exposure, the new risk-adjusted accelerated completion date (May 2021) was still seven months earlier than the original December 2021 date. Earlier completion with managed risk exposure is a win-win scenario.

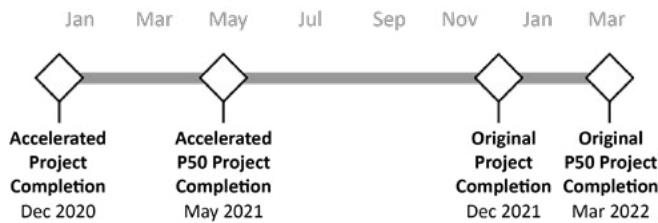


Figure 1-2: Impact of risk on an accelerated scenario

Chapter 2: S5—Gaining Team Buy-In

Projects are executed by humans—domain experts have the final say about activity durations and required scope.

So even the best schedule can go awry without team buy-in—arguably your most important success factor. If team members don't believe a schedule is achievable, it probably isn't. Before acceleration can become your execution plan, ensure that the team embraces S3 and S4 mitigations and changes.

ACCEPTING OR REJECTING ACCELERATION S4 CANDIDATES

Figure 2-1 shows a scenario in which targeted activities must be completed in less time to accelerate the project. For instance, detailed design work needs to be completed in half the allotted time. Before agreeing to this scenario, the team needs to review options like assigning more resources, outsourcing to a third party, and/or cutting scope.

#	ID	Description	Activity Type	Remaining Duration	WBS Code	WBS Name	Current Schedule	Accelerated Scenario
WBS Name: Detailed Design (5 items)								
1	0300	Communications	Normal	5	Current Schedule.0040	Detailed Design	5	-2 (-40%)
2	0310	Interfaces	Normal	25	Current Schedule.0040	Detailed Design	25	-12 (-48%)
3	0320	Electrical	Normal	20	Current Schedule.0040	Detailed Design	20	-10 (-50%)
4	0330	Topside	Normal	30	Current Schedule.0040	Detailed Design	30	-15 (-50%)
5	0340	Support	Normal	6	Current Schedule.0040	Detailed Design	6	-3 (-50%)
WBS Name: Procurement (4 items)								
6	0350	Bid reviews	Normal	30	Current Schedule.0050	Procurement	30	-15 (-50%)
7	0360	Initial Long Lead Items	Normal	90	Current Schedule.0050	Procurement	90	-45 (-50%)
8	0370	Vendor B	Normal	15	Current Schedule.0050	Procurement	15	-7 (-47%)
9	0380	Vendor C	Normal	20	Current Schedule.0050	Procurement	20	-10 (-50%)
WBS Name: Domestic (5 items)								
10	0420	Phase 2	Normal	10	Current Schedule.0060.0440	Domestic	10	-5 (-50%)
11	0430	Phase 1	Normal	4	Current Schedule.0060.0440	Domestic	4	-2 (-50%)
12	0460	Phase 5	Normal	20	Current Schedule.0060.0440	Domestic	20	-10 (-50%)
13	0470	Phase 4	Normal	15	Current Schedule.0060.0440	Domestic	15	-7 (-47%)
14	0480	Phase 3	Normal	5	Current Schedule.0060.0440	Domestic	5	-2 (-40%)
WBS Name: Construction (5 items)								
15	0530	Electrical	Normal	40	Current Schedule.0070	Construction	40	-20 (-50%)
16	0570	First Wave	Normal	40	Current Schedule.0070	Construction	40	-20 (-50%)
17	0580	Site Establishment	Normal	30	Current Schedule.0070	Construction	30	-15 (-50%)

Figure 2-1: Activities targeted for acceleration

The possible outcomes are full buy-in on acceleration; partial buy-in, where the team believes it can achieve 25 percent acceleration but not 50 percent; or no buy-in on achieving acceleration.

If you are unsatisfied with less than full buy-in from the team, rerun the model for another set of targeted activities and ask the team to review and respond. Continue this process until you achieve an acceptable level of buy-in on the S5 plan.

Just remember: The harder you squeeze a sponge (or a schedule), the more resistance you get. You'll eventually squeeze until you can squeeze no more. While it's easy to accelerate a one-year project by a day, it becomes increasingly difficult to accelerate by a week, a month, or more. And the more you accelerate, the more your risk exposure may increase.

CONSENSUS-BASED PLANNING

An emerging approach to building realistic schedules is consensus-based planning for durations and risk scores. The risk register established in S3 captures current-state and mitigated-state risk scores, but it doesn't adequately capture differences in opinion among team members.

Collaborative tools help you achieve S5 buy-in by setting the stage in S3. You can capture team member opinions on risk events and arrive at team consensus. You can then incorporate this consensus-based risk register into your risk model, analyze it, and compare it to the original risk model. The comparison will help you gauge the degree of buy-in, which will make achieving S5 buy-in a smoother process.

REPEAT > REPEAT > REPEAT

S1 // S5 is a proven technique. It works. In S5, you've established a structurally sound, risk-adjusted, accelerated version of your S1 CPM schedule—and you have team buy-in.

But caveat emptor: One certainty in scheduling is that projects continually evolve, so schedules will always be out of date. Your schedule needs to reflect changes, so S1 // S5 is a continuous-improvement process. That's why you should recycle S2 // S5 whenever you encounter a material change or update.

Another benefit of repeating this process is looking back at how completion dates have changed and risk exposure has evolved. This historical trending data builds your confidence in predicting the future. After all, that's what project planning really is—using your past experiences and knowledge to predict the outcome of your next big project.



Chapter 3: The Bigger Picture: Cost Forecasting

Cost is a key element of the three-legged project stool that we haven't talked about much yet. In fact, cost is probably the most important factor that bubbles up through a project to the enterprise. This chapter focuses on the value of building cost- or resource- loaded schedules, and reveals how S1 // S5 can help with cost forecasting.

Whether you're executing rudimentary cost modeling or advanced government compliance-based earned value performance analysis, a sound basis of schedule is an absolute necessity. Schedule is king—for project-led organizations, schedules play a huge role in corporate-level cash-flow and finances.

COST- AND RESOURCE-LOADED SCHEDULES

When it comes to managing project costs, you have two options:

1. An integrated cost- and resource-loaded schedule.
2. A detailed cost estimate managed separately from a schedule that isn't cost- and resource-loaded.

Both approaches have strengths and weaknesses, and both have their place.

The Resource-Loaded Schedule

A resource-loaded schedule is a marriage between activities required for project completion and labor and non-labor resources required for activity completion. You assign resources to each activity and ensure that available resources match the activities' resource needs.

If your resources and activities don't match, you have two options:

1. Time-constrained scheduling
2. Resource-constrained scheduling

Time-constrained scheduling: Time-constrained scheduling assumes no constraints on resources. Your objectives are determining how many resources satisfy the timeline at the activity level and examining the entire schedule to generate a resource demand curve.

Resource-constrained scheduling: Resource-constrained scheduling is a little more involved, since you need to adjust the schedule to accommodate resource availability.

Deriving cost from resource-loaded schedules:

Another great thing about resource-loaded schedules is that by conducting S1 // S5 analyses and assigning resource quantities and cost rates, you can derive total activity costs. That makes it much easier to arrive at project cost, generate true project cash flows, and determine the positive or negative rate of spend over time as you update your schedule.

S1 // S5 AND EARNED VALUE (EV)

Earned value is a technique for tracking project performance, comparing financial expenditure to project-generated value, and considering how much you should have spent. An EV model brings the planning tools of scheduling and cost estimating together to create a view of where and when you'll spend money and earn value.

For your EV model to be realistic, adhere to S1 // S5 to ensure that the time-phasing of project costs is as accurate as possible. If you get this wrong, your performance tracking using EV will be flawed. When you get it right, you have a highly defensible model against which to manage performance.

FEED THE ERP USING YOUR SCHEDULE

Here's one more reason project schedules are so important in your organization's big picture: They play a huge part in predicting the financial impact of a contract win (or an investment) at the enterprise level.

Strictly speaking, a project doesn't generate revenue—it's a capital expenditure (capex). A project's resources and timing impact top-line financials, revenues, earnings before interest and taxes (EBIT), cash, capex, new orders, personnel, and material needs. Only when a project goes into operation—and reaps ROI—does it become an asset.

Enterprise resource planning (ERP) systems collect, store, manage, and analyze business activities. In project-led organizations, this can mean pulling project spend and revenue into a financial-based model that runs the overarching business.

ERP systems are powerful, but how nicely will they play with your scheduling system? Many generic ERP systems meet general organizational needs, but can't easily track specific project costs and schedules. Generic ERP systems often require companies to turn the standard chart of accounts into a complex project tracking system, which requires them to fit square pegs (project/WBS/activity data) into a round hole (the chart of accounts). That's no easier than it sounds, and it creates reconciliation, reporting and auditing nightmares, particularly if compliance is vital to success.

Project-led organizations need an ERP system that integrates with data on project costs and time. With a project-centric ERP system from Deltek, detailed project data is organically fed into your ERP-based cost accounting. No need to fit square pegs into a round hole. With Deltek, every transaction is connected to an account, an organization, and a project. This ensures that all ledgers in the ERP are the same—no reconciliation required.

You can learn more about how Deltek's project-based ERP systems help you plan and execute projects at www.deltek.com.

The bottom line is that with Deltek, your top-down ERP analysis is based on accurate information from the projects driving your business.



Chapter 4: Realistic, Achievable Schedules=Successful Projects

Projects rarely if ever fail because of poor execution. Essentially, a successful project boils down to one thing: excellent management. And excellent management boils down to planning a realistic, achievable schedule that the project team uses as a blueprint for on-time, on budget, and successful execution.

Countless organizations have adopted S1 // S5, because they've seen that projects planned with S1 // S5 achieve higher success rates.

When you apply the S1 // S5 techniques in this book and in [Creating, Critiquing, and Risk-Adjusting Your Schedule](#), your projects will succeed by being transformed into assets that contribute to your organization's financial success.



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