

HOW 'PRE-PLANNING' DRIVES PROJECT SUCCESS

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PLANNING & SCHEDULING

Introduction

What is your first inclination when someone says “Okay, go ahead and build the plan”? For years, my reaction has been to fire up a scheduling tool such as Primavera and start throwing activities and logic onto a blank sheet building a nicely formed schedule. In recent years, however, my thinking on this has significantly changed. I now strongly believe that the first part of planning a project is (what I am going to call) “pre-planning.”

Scheduling tools have been designed to calculate dates based on durations and sequence of work. That is all very well but before we even start to build our plan, shouldn't we first establish exactly what it is we are setting out to build? Why do we think it's okay to dive straight into the “how to build something” before we've first established the “what we are building”?

During countless schedule reviews and risk workshops I have heard the comment “What exactly does this activity represent?” or “Well, the duration really depends on what the scope of this is.” The problem is this: scheduling tools have not been designed to properly differentiate between scope and work, i.e., “What are we building?” versus “How are we building it?”

This paper is not a discussion on whether Critical Path Methodology (CPM), the underlying calculation for establishing a schedule, is valid or not because it is valid, period. The world has been using CPM for decades, and I'm not about to suggest that this is the wrong approach. Instead, this paper is a discussion about how we could all benefit from better defining the what before we dive into the how so that we have a stronger framework against which to establish an achievable and realistic plan.

A New Phase in the Project Life Cycle

What if we're to take the liberty of tweaking the traditional project life cycle (initiation, planning, execution, closeout) to better differentiate between planning our scope (the deliverables for the project) and our work (the activities needed to deliver those deliverables)? Let's call this differentiation “pre-planning” and “planning.”



Introducing Pre-Planning

Let's determine that pre-planning is all about defining our deliverables. If we are building an offshore oil platform, we may define our deliverables as "platform," "subsea infrastructure," and "sub surface/wells." If our project is a linear road construction project, then we may define our deliverables by sections of the road, e.g., "West," "East," etc. A deliverable is a discrete entity that, as a product of a development process (work), is provided or delivered to the client/owner. Pre-planning is the defining of scope and timelines for deliverables. The question of "How do we build these deliverables?" comes later during the planning phase.

Hierarchical Deliverables

Deliverables by their very nature, need to be modeled in a hierarchical manner. By defining deliverables in a top-down hierarchical manner, we get the benefit of being able to iteratively define more and more detail about the scope of the deliverables that we are setting out to build.

Don't we already model this using Work Breakdown Structures?

Now you may be thinking, "I can already define hierarchical deliverables in MS Project and Primavera using a Work Breakdown Structure (WBS)."

Well, the fact is you can't and here's why: the problem with CPM tools with respect to a WBS is that they mix work and scope with no true distinction between the two. Create an activity in MS Project and call it "Earthworks"; subsequently create a child activity underneath it called "North" and the "Earthworks" activity automatically becomes a parent WBS. In reality, it is simply a summary of the detailed work within it. It doesn't represent scope or deliverables. It's really more of a work summary than a definition of scope – hence the name "Work Breakdown Structure." Even worse, as the work (as defined by an activity) grows or shrinks, the WBS parent automatically resizes to accommodate. It is truly a summary of work and not a representation of the thing(s) that we are building. As a project owner, I care more about when I am going to take receipt of my project deliverables and less about how my project contractor is going to execute the work.

Time Phased Deliverables

Now let's turn the tables and think about traditional scope planning. Over the years, scope planning has lent itself to defining a hierarchy of deliverables, but it hasn't crossed into the domain of scheduling or time phasing. Work Breakdown Structures can arguably be used as a stop gap to capture a hierarchical set of deliverables, but they don't lend themselves to defining timelines. This is, again, where traditional scheduling tools are lacking.

Let me elaborate.

Irrespective of whether we use a WBS or some other hierarchical structure to model our deliverables, we need to tie this to the concept of time. When we define deliverables in a project, we should also consider expected or desired timelines. "On our previous EPC project, engineering took 9 months, procurement 12 months, and construction 18 months." From this, our deliverables carry a top-down estimate representing expected (and even benchmarked) timelines.

WBS or summary activities in a CPM tool don't have such a concept of carrying a timeline; as I've already mentioned, they automatically grow or shrink based on the activities that they encapsulate. Further, they are all tied to activities, logic, calendars, and other building blocks that we use when we get into the detailed work schedule part of planning.



Traditional WBS or other hierarchical structures in CPM tools don't lend themselves to modeling deliverables; they are all driven by activities/work. We need another way.

Introducing Planning Packages

What if we were able to not only define hierarchies of scope but also define top-down timeline estimates without having to define activities and logic?

If we were able to define such timelines freely, we could then do our bottoms-up planning (with activities and logic) and have something to compare against. We could have a benchmark or date against which to measure the alignment of stakeholder expectations and the time that the work will actually take. For example, our desired top-down timeline forecast is 39 months, but our bottoms-up CPM schedule shows we need 42 months. What does this tell us? We either need to adjust our work rates to accommodate the 39-month expectation or relax our expectations and accept the fact that the work will take 42 months. This now makes our plan valuable. For the first time, we are now able to validate and then calibrate the plan against our deliverables and stakeholder expectations. No longer do we need to embark on executing a plan that the team doesn't believe is achievable. Again, as a project stakeholder, is 39 months good or bad? How can I tell unless I have already agreed with the contractor what our expectations are and how closely are they aligned with the forecast of the bottoms-up plan itself? If the project runs out to 42 months, then execution must be to blame, right? Wrong. What if the 39-month plan was simply too aggressive based on the scope of the agreed upon deliverables? In which case, execution may have been fine; it was the plan that was wrong.

Now think about this: when you conduct a schedule risk analysis on your CPM schedule, what are you really entering as inputs (as part of your three-point uncertainty ranging)? You are entering the team's opinion as to whether they believe the plan or not; the output from this is then a probability and range of completion dates. Why not capture this expertise up front in the early planning process and set targets and expectations accordingly? At minimum, the result will be a much tighter distribution in those ranges indicating a higher degree of buy-in and confidence in the plan... from the onset of the project!

These are the very concepts that the pre-planning capabilities of InEight Basis have been built on. For the first time, you can:

1. Define your set of project deliverables
2. Establish as much detail as needed for these by building a hierarchy of deliverables
3. Freely establish timelines for these deliverables
4. Establish desired delivery dates

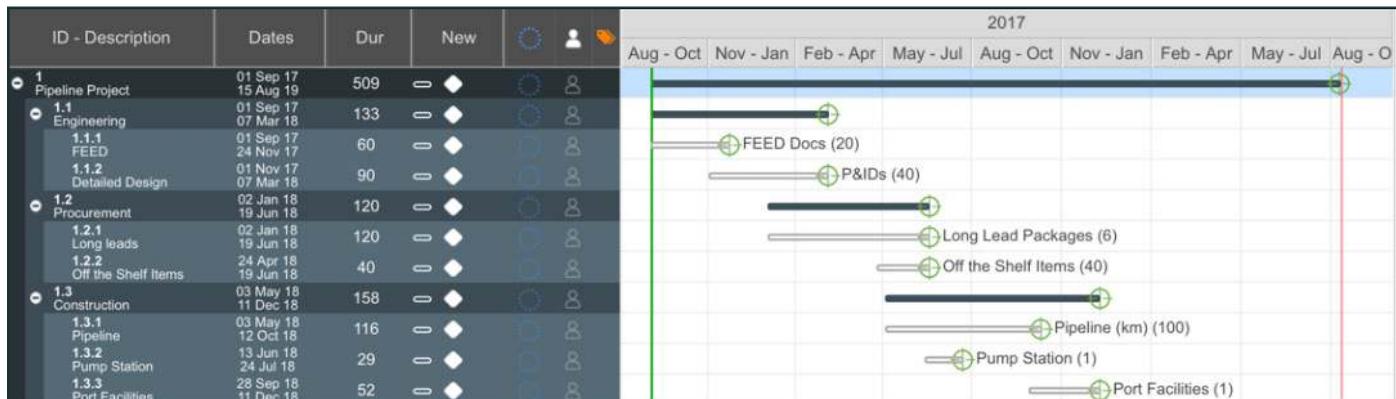


Figure 1: Planning Packages Depicting Deliverables & Their Target Timelines

The ability to conduct this type of pre-planning, avoiding the complexity of defining activities and logic, is especially valuable when conducting interactive planning workshops. Workshop participants want to focus on giving their project expertise, establishing reasonable timelines, and not getting caught in the weeds with the likes of “Yes, we can model engineering starting in June, but we will need to add a constraint and set a 7-day calendar.” Using planning packages in In Eight Basis enables a project team to sketch out their schedule, capture domain expertise, and set target dates, plain and simple.

What about Deliverable Quantities and Rates?

When defining timelines for our deliverables, it’s important that we account for quantities. If we are building a 100km pipeline, then our deliverable timelines should consider the quantity (100km). If the scope of our project then changes (e.g., 100km to 75km), then we ought to follow a logical process for adjusting our deliverable timelines accordingly. Tying deliverable timelines to quantities also opens up the door for benchmark-based planning. Imagine being able to repeatedly pull from your organization’s knowledge base containing previous projects, extracting benchmarked sets of timelines for known deliverable types, and then calibrating them based on the specific quantities associated with your project! Well, that is exactly what you can do in InEight Basis when defining your top-down deliverable based plan. Not only are you reusing previously developed sets of project plans, but you are also now able to adjust them accordingly based on the specific size and scope of your project.

Not only that, but you should also be able to hang high-level costs (or even value) against your deliverables (planning packages) and then track the impact of quantity changes on those costs.

InEight Basis makes it very easy to define quantities against deliverables as well as calculate top-down cost estimates based on those quantities. Further, as you flesh out your plan (bottoms-up CPM scheduling), you can then compare your top-down cost estimate against your detailed bottoms-up plan. What does this tell you? It tells you whether the work needed to execute your project is going to take not only more or less time than forecasted, but also whether you have estimated sufficient budget or not.

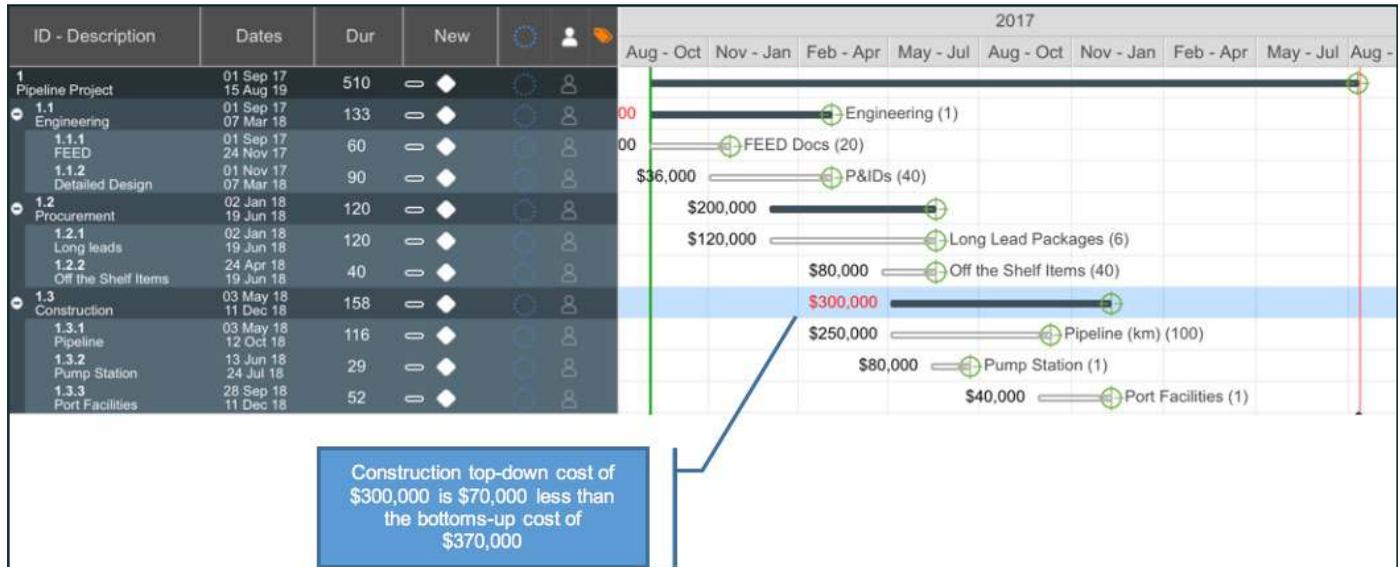


Figure 2: Deliverable Quantities & Derived Durations/Costs

Planning Performance

I have spent 20 years developing project management tools that help improve the science of project forecasting (CPM). As such, I am not so bold (or naive) to think that we need to abandon or replace CPM. (Some have tried over the years, and there is a reason why they have failed.) CPM is a sound practice; it is tried and trusted.

I believe, however, if we tie our bottoms-up CPM schedule to our pre-plan, then our plan becomes more realistic and achievable. By taking our top-down deliverable-based plan (the “what”) and comparing it against our bottoms-up CPM (the “how”) schedule, we can easily establish whether the project is going to be successful even before we start execution. Execute a plan that doesn’t align with your top-down deliverables, and you can be sure you will fail even before you start.

Linking our pre-plan with our plan is simple using InEight Basis. We can take advantage of insights such as looking at Plan Alignment (how close our work timeline is to our deliverable targets) as well as evaluating how many activities in our detailed plan breach our established dates as defined by our top-down plan.

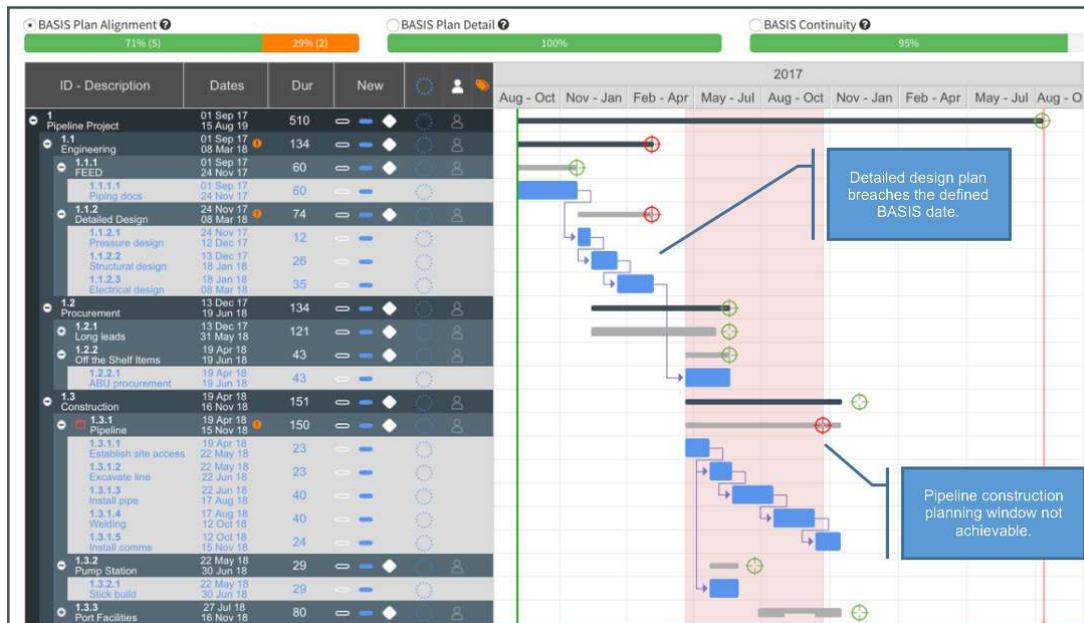


Figure 3: Top-Down Meets Bottoms-Up

Having these insights or metrics allows us to calibrate the plan ensuring it is achievable. Establishing a high degree of team member buy-in on your project plan is probably the best indicator that you have a realistic and achievable plan. At the end of the day, it's your team members that carry the domain expertise as to how to build your project. By adopting the pre-planning approach in InEight Basis, you are in effect tracking the performance of your planning!

Conclusion

Defining how to build something before you've properly established what it is you are about to build is poor management. For years, CPM tools have driven us to focus on the "how" without accommodating the need for firstly understanding the "what."

By properly defining the extent and scope of what it is we are building and then determining how long it will take to execute the work enables us to set realistic expectations up front, setting our project up for success rather than failure.

For too many years, project management has measured success by comparing planned versus actual durations and costs. We are now taking that a step further (as a precursory step) by firstly comparing deliverable timelines and costs with how long and how much the work will take to achieve those deliverables. Understanding the realism of your plan during the planning phase is as important, if not more so than tracking performance during execution.

Sound planning and execution performance together result in a successful project.



About the Author

Dr. Dan Patterson founded BASIS which InEight acquired in 2018 and re-branded as InEight Basis. Since becoming a member of InEight's executive leadership team, Dan is focused on expanding his vision of creating next generation planning and scheduling software solutions for the construction industry.

As a globally recognized project analytics thought leader and software entrepreneur, Dan has more than 20 years of experience building project management software companies. Throughout his career, Dan has focused on solution innovation and project management, including advanced scheduling, risk management, project analytics and AI.

Dan is a certified Project Management Professional (PMP) by the Project Management Institute (PMI). He attended the University of Nottingham in the UK where he earned a bachelor's degree in civil engineering and a PhD in construction management.

For more information about InEight Basis' planning and scheduling solutions, visit ineight.com/contact.

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