How To Fix A Broken Scheduling System

For an industry striving to be more productive, the current state of scheduling practices is wasteful. To learn how to “right-plan” our projects and achieve better results, we first must look closely at our own scheduling practices and create a dialogue within the industry about which practices are efficient and which are not. While there is still a role for traditional critical-path-method (CPM) scheduling as a high-level, strategic road map, there is often too much detail in schedules.

Schedules with an exhaustive level of detail in a CPM network try to predict day-to-day activities years in advance and are inherently flawed. Detailed schedule specifications can require tens of thousands of interdependent activities, based on maximum activity durations that are too short, and result in a series of assumptions that frequently cannot be validated early in the planning process. On top of that, we spend many hours each month updating, resource and cost loading, and revising these schedules to reflect the construction process. Simply, we have created a monster.

There is a better way to create a smooth, more reliable workflow that maximizes productivity and minimizes waste. Production planning, which creates short-interval schedules for up to four weeks at a time and plans around milestones, is an effective way to right-plan projects. Lean pioneer Toyota daily plans production in response to current customer orders. According to the Lean Construction Institute, the use of Last Planner System, a production planning system designed to produce predictable workflow and rapid learning, has increased geometrically.

The growing interest in how scheduling practices can be improved prompted Stanford University’s Center for Integrated Facility Management (CIFE) to research two large-scale DPR Construction jobs—one estimated at more than $1 billion, the other at more than $90 million. CIFE’s research found that project teams can make better use of dollars by creating and managing milestones at the strategic level as well as using production planning to schedule detailed production in short intervals with Last Planner System methodology.

Systematic Optimism

The study also revealed that while CPM network predictions are valuable, they are systematically optimistic and consistently late, due to variable field conditions. Participants said they found multi-tier scheduling—which involves a master schedule comprising milestones, along with production planning for short-interval daily planning of three to four weeks within the milestones—to be helpful.

For example, on the recently completed $151-million Temecula Valley Hospital project, there would have been more than 2,000 activities if the team developed a detailed CPM schedule. As the project progressed and the inevitable real-world challenges arose, the team would have spent hundreds of hours updating and revising the complicated network. Rather than create a highly detailed schedule, the team developed a plan in sufficient detail to have confidence in sequences and durations and, from that, summarized a series of milestones. Next, before the start of construction, integrated-project-delivery partners’ general foremen for MEP and drywall spent two hours each week for over a year to plan workflow. They reduced the original schedule by six months, saving over $3 million in combined general conditions. The project’s master schedule was revised accordingly and then pulled and managed using a combination of ourPlan (a cloud-based Last Planner System application), “First Run Studies” (equivalent to game film) and continuous productivity analysis.

The hospital came in two weeks ahead of an aggressive schedule and an astounding $1.1 million per bed, far below the best-cost range for full-service California hospitals.

There is room for improvement. CIFE’s research showed that developing clear metrics to increase visibility into cost and increasing subcontractor input, during both design and construction, could be beneficial to the scheduling process. We learned we can deliver projects much faster if the right people are involved with planning at the right level of detail at the right time—all it requires is a change in the way we plan and how we communicate it.

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