

Viewpoint

ENR July 17, 2000, Page 111

Project Management

Gregory A. Howell

Think of the Queue Behind You

Project Management must be reformed. I thought something was wrong the first time I filmed a construction operation as an undergraduate student in the 1960s. What I saw on the film was at odds with what I expected, and wasn't explained in class. Since then, experience has convinced me that project management with its focus on activities, schedules and cost control is the root of the problem.

Those early apprehensions were supported when I managed Timelapse Inc. From 1975 to 1985, I made studies by recording what actually happened at the work face. Every film was radical and compelling; the opportunities to improve were overwhelming. Productivity was easy to improve when we could overcome the pressure for immediate production. Repeatedly we found that this pressure caused people to organize their work to complete the next unit of whatever they were working on, with little thought for completing all of their required tasks.

INEFFICIENT BUFFET This problem is apparent at most seminar buffet lunches. Hotels don't like to tables away from walls so the line runs down one side. By the time we get there, 25 people are in line. Each one is making an a sandwich and moving too slowly for us. We could cut the line in half by moving the table off the wall. But the five people currently at the table oppose the move because they want to finish making their own sandwiches. The person about to pick up a plate favors the change – but only after filling the plate.

My daughter hates it when I do what has to be done. She gets embarrassed when I stop the line and move the table. I'm guaranteed the support of the people at the end of the line because they realize the value of redesigning the operation to speed completion of the last sandwich instead merely the next.

I see the same problem on construction sites. The pressure for production starts from the planning and control system and is transmitted to the crew by supervisors chasing reportable progress. Carry it further, and you get "Show pipe" – pipefitters term for describing the practice of hanging pipe for "show."

Doing the easy work first makes the progress reports look good but destroys the orderly and predictable flow of work. Profit drains away as people work in roundabout ways that are hard to imagine if you don't stand there and watch. The problem is not caused by stupid people. Rather, they are doing just what they are told: Make the cost and schedule reports look good. Cost controls hide the waste they create by making workflow between crews unpredictable. But what does this mean for planning?

I can almost hear a voice from the back of the room saying, "Sure, workflow is unpredictable. It's an uncertain and crazy world." My reply: This "helpless victim of

fate” argument assumes uncertainty arises from external sources. Evidence shows that current planning systems themselves also cause unreliable workflow because assignments to crews are more dream than plan.

Plans require: 1) assured resources, 2) work scheduled in the most logical sequence, and 3) assigned work that is well within the crew’s capability. But on most jobs, only 50% of tasks are completed in the week assigned because the assignment, when made, failed to meet those three criteria. These are planning failures; the reasons can be traced and a recurrence of these failures, prevented. The completion rate can be improved to around 85% by assuring that those criteria are met before assigning tasks. This means just saying “no” to defective assignments.

If you improve the reliability of planning, projects get done sooner, for less cost. (To test this, drive on a crowded freeway and watch what happens when an erratic driver injects variation into the traffic flow.) Measuring planning system performance is the only way you can tell if your planning system is working. Improve its performance and you can tame the dreaded trade-off between schedule and costs. But just as that erratic driver thinks he and everyone else can get home quicker by rushing and slowing, most project managers presume that optimizing each activity optimizes the project.

Project management must shift from the management of activities by cost control to the control of production. We must shift from improving productivity to managing production. Now I can hear the objection: “Construction isn’t manufacturing.” Actually the “Toyota Production System” started a revolution that is spreading to construction through its suppliers, innovative practitioners, and academics. The system’s advocates include the International Group for Lean Construction (online at <http://cic.vtt.fi/lean>). Called “lean” to distinguish it from “mass” or craft production, this system works wonders in design and construction.

STOP THE LINE I have to confess. All my films to analyze and improve productivity made little difference. Too often, they only increased the variation in the larger production system. While I was filming projects, Toyota’s Taiichi Ohno was trying something new, challenging the traditions of manufacturing. He required workers to stop the line and say “no” when they received a defective part, even though this reduced productivity. He learned that speeding up activities or minimizing their cost added variation and reduced total performance.

We have the same problems in construction, but “conventional” wisdom blinds us to the solution. Classic project management, the kind advocated by the Project Management Institute in Upper Darby, PA., carried us a long way. But it isn’t up to managing complex, uncertain and quick projects. The conceptual breakthroughs to reform project management will come from lean production and its application to construction.

Gregory A. Howell, P.E.

Director of the Lean Construction Institute in Ketchum, Idaho. He may be emailed at ghowell@micron.net.