Once upon a time, a long time ago, there lived the perfect construction worker. He was tall and strong and never complained about even the most menial of task. He arrived to work on time, never went long on breaks and remained enthusiastic around co-workers and supervisors.

He was loyal, responsible and a self-starter who always tried to solve his own problems with creative solutions. In addition, he never failed to perform a task according to estimated man-hours and never ever left a job unfinished.

And it was good.

The clients loved him, work kept pouring in, and they all lived happily ever after.

The End

A fairy tale? Well, I think so, but just in case, if you do know a worker like this ... please send him to me! For the rest of us, I don't think I'm out of line in saying that this sort of employee doesn't come along each day. Now, I'm not complaining, I'm just being realistic ... and setting up a point. You see, the cold, hard truth is that all workers are not created equal. Some really do hustle, out-smart, and out-perform their jobsite counterparts. In short, some really are more productive than others.

Why? Well, there are many possible reasons, and they're as varied and infinite as the human condition. It might be one worker is simply more experienced or has more of a natural inclination for the work. Or, it could be the result of a better attitude toward work ... and life. But realistically, the why of the situation may be irrelevant to our cause in that we're never going to change people as a whole. The pool of human resource is what it is, and it's probably counter-productive to sit and lament over things that are never going to be.

Quantifying Productivity

But that's OK—because I'd submit that the most important thing to be gleaned from this understanding is that it's not unusual to have work crews made up in such a manner; with a natural
stratification of talent-level, expertise and attitude. Knowing this, the construction project manager can justifiably take into consideration, when assigning crew members to jobs, which workers are his “A” people, “B” people and so on. As part of his daily regimen, he attempts to match the skill-level of each worker to the level of skill required for the project at hand—while simultaneously performing the fiscally-responsible balancing act of spreading out and utilizing his company’s resources to best benefit the firm.

In simpler terms, the project manager (or possibly the job superintendent, depending on the company and the size of the job) isn’t likely to put his best carpenter on the simple patio deck while assigning the intricate Georgian trim details to the first-year apprentice. It simply isn’t the best way to utilize the talents he has available. The PM is fully aware and has full expectation that one worker will out-perform the other, and he assigns the work accordingly. And though he may not even realize it, and though this is just one element of a much larger picture, the PM is engaging in a long-standing but often elusive ritual that’s performed by construction supervisors all over the world: He’s attempting to quantify worker productivity.

**A Moving Target**

But of course there’s more to the jobsite productivity equation than worker ability. Productivity comes in many forms and guises. Variables such as work environment, weather, project communication document quality and more enter
All members of the team have to work in united effort to continually and doggedly identify productivity lapses.

But what is productivity? For our purposes, it's the attempt by a contractor employer to measure worker efficiency. How does he do that? One accepted method is to express productivity as a ratio that's found by dividing the number of worker man-hours actually spent on a jobsite task by the number of man-hours actually earned for that same task for the same period. In an ideal world, the amount earned would equal the amount originally budgeted, so the two terms are used interchangeably for our base equation. The lower the number, the better. If you apply the math and your result is less than one, you have an (albeit simplistic) indication that productivity is good. Should the number be greater than one (and all other criteria

into the productivity mix. To make things even worse, lapses in productivity often strike with little fanfare or warning. Indeed, at times it can seem like getting hold of this slippery thief can be tougher than calming a hummingbird. In fact, a particularly nasty trait of poor productivity is that you may not even know you have problems until after they occur, showing up only after you've reconciled your books and performed final closeout for the job ... and then it's too late.

But though it may require some effort, productivity can't be left to chance. Why? Because poor productivity will always translate directly into lost profit for your company. Always. Inversely, if you find ways to increase the productivity of your workers, you will increase profits. It's that simple. This is why all members of the construction team—the project owner, architect, PM, office staff and the trades—have to work in united effort to continually and doggedly identify productivity lapses when they occur, and learn to recognize ahead of time those work environments that spawn such lapses.
is reasonably trustworthy), it may indicate a productivity decline—and a cause for concern.

**The Criteria**

Assuming the general conditions (those indirect costs affecting virtually all work in the field such as mobilization, supervision, fuel, on-site storage, etc.) associated with that task are weighed separately in a similar fashion, determining the actual man-hours spent on a task (direct cost) is a relatively straightforward affair and can be found and monitored via jobsite field reports, time sheets and payroll records—assuming the tasks in question have been broken down and allocated to the proper cost codes. If that isn’t the case, then I believe we’ve stumbled onto our first lesson: Always (and I mean *always*) track and maintain thorough and accurate labor records in the field. Besides benefiting you in other ways (such as legal and costing), this documentation is absolutely essential if you’re going to seriously tackle productivity.

Determining the man-hours actually earned (budgeted) for a task can be a bit trickier—particularly when in the middle of a project. At the end of a job, the ratio is comparatively easy to determine by simply dividing the original lump-

*Poor productivity will always translate directly into lost profit for your company.*
Lack of planning is another leading cause of poor productivity. The cure is sound construction management.

sum budgeted cost (assuming no change orders) by the actual number that is determined from field records and payroll. However, during the course of a project, billings and payments are commonly spread out over several months. In this case, it’s common practice to arrive at a percentage of work completed (for example, is the actual work in the field 20 percent, 50 percent, or 80 percent complete?) for each line item in that billing period.

Let’s look at an example. Let’s say your total job budget for carpentry labor is $10,000 and through the first billing period (normally the first to last day of the month), you determine the carpentry work for the project is 50 percent complete. This would put your budgeted value for the carpentry at $5,000. Now you review your actual cost-to-date for that labor. Lo and behold, you show a total outlay of $6,300 for that period. You divide the budgeted value ($5,000) by the actual amount spent ($6,300), and you arrive at 0.79 (rounded-off) . . . a bad omen. This is a simple example (one you could likely do in your head), but when combined with perhaps 10, 50 or even 100 other billing line-items, you can see how this simple check and balance (perhaps as an added column to your billing spreadsheet?) might make for cheap insurance-and an indicator of possible productivity concerns.

But though helpful, these ratios will only be of tangible use when both the percentage-complete (which will determine your budgeted cost or “earned” amount) and the actual cost (from your records) are truly representative of the work performed. If one or both of these are skewed, the results are pretty much meaningless. Arriving at these numbers on the fly is no simple task . . . and no place for amateurs. It’s quite common for other more judgmental factors to creep in to skew these numbers (see examples below), so only experienced and skilled construction project man-
Always (and I mean always) maintain thorough and accurate labor records in the field.

Managers and estimators can even hope to come reasonably close. Therefore, lesson number two would be this: Hire and pay for the best people. The extra $10,000 to $15,000 you cough up now in salary will more than cover revenue generated down the road.

**Changes in Scope of Work**

Ok, so far so good. But what happens when our pristine budget number and carefully calculated percentages are altered due to change orders? Well, don’t panic. The process is essentially the same, but with an added step. When a change occurs, select the billing line-item that best represents the same scope of work as that in the change order. Yes, this may involve breaking the total change amount down into the different trade classifications (like plumbing, saw-cutting and concrete patch work for an added sanitary line in a building) and assigning dollar amounts to each. Of course, it should all add up to the total change amount when completed.

Once broken down, add the new budgeted amount for the change to the original (base) budgeted dollar amount for that line item. Then, the only important thing to remember is that the next time you calculate the percentage-complete
If you don't account for work that is not assignable to a budget, those man-hours and material costs turn into charity work.

for that line-item, you have to be sure to take into consideration both the base work and the added change when arriving at your new percentage-complete.

Now of course the exercise above assumes you are collecting on the change order in the first place. No. I'm not being funny. We all have times when we're not very good at keeping up on (what can be) numerous changes that occur on any construction project. It's simply too easy to let a few slip by during a normal, hectic day. But as you can now more easily visualize from our simple equation above, productivity ratios will only stay positive when there is a budgeted amount of revenue to apply to the additional work. When work is performed in the field that is not assignable to a budget (often through a change-order not applied for or approved), those man-hours and material costs spent completing those activities turn into charity work—and as benevolent as it may seem, construction contracting isn't a not-for-profit enterprise.

Other Productivity Thieves

Now that we know how to track it—what are we tracking? Well, many things can adversely affect productivity on the work site—too many to adequately address in such a short piece—but here are a handful of common culprits to watch out for:

Weather. Obviously, this one is simply out of your hands, but there are many things you can do, such as careful monitoring (do you know they have Doppler networks on the Internet?) and disciplined, daily planning and positioning of work crews to help your cause.

Height and levels. This formula is relatively easy to understand: The higher you go, the more likely you'll require additional scaffolding, staging, hoisting, craneing, etc. Now yes, the direct cost for these items is often assigned when calculating general requirements for the project, but seldom is the actual loss of worker productivity taken into account. In short, a mason is not going to lay as many bricks in the same period of time on the fourth floor as he would the first.

Work having to be repaired or re-done in the field. This is a productivity killer—because you not only lose productivity, you also lose credibility. Poor quality is the easiest way to lose your next sale. Insist on quality work from your people, for quality isn't just a hollow business mantra—it directly effects productivity and profits.

Poor-quality architectural documents and/or detailing. When a worker has to
stop to clarify (or even find) a detail for the work he’s performing, job continuity is interrupted—and productivity negatively impacted. In my experience, this has been one of the greatest (if not the greatest) causes of productivity lapses out on the site. Since back-charging the A/E for this lost time is seldom done (perhaps it should be more often), the onus falls on the contractor to flush out all needed details and information early on (and preferably before his workers are-on site).

**Poor supervision, planning and scheduling.** But we contractors aren’t perfect either. Lack of planning on our part is another leading cause of poor productivity. The cure is sound construction management. Project schedules should be created with input from all affected trades, and the schedule should be constantly stressed and reviewed throughout the course of the project. Besides overall project schedules, smaller interim (such as weekly) manpower schedules should also be created to enhance continuity.

**Excessive safety, security or protocol requirements.** Clients such as nuclear power plants, medical facilities and some factory settings often require that extra-stringent security or safety requirements be implemented during construction. They can range from a simple set of safety glasses to taking an hour every morning to pass through security to get to your area of work (as with the nuclear plants). Either way, this lost time should be accounted for in your bid.

**Learning Curves.** Bringing on new people means training periods, and the more your people are being trained (or doing the training), the less they’re producing. Learning curves go hand-in-hand with employee turnover, and the only way to quell turnover is through dedicated and consistent efforts to offer good wages, benefits and programs to boost employee self-esteem and morale.

And while we’re on the subject, **poor worker morale** by itself can play a huge (and detrimental) role in employee productivity. Morale is a very real and potentially profit-draining business liability when left unchecked, and should be handled with the same tenacity as loss-prevention or drug programs. Most of the time, all it takes is a company picnic, company newsletter (to keep the employee more involved) or (better yet) a few nicely placed bonuses.

**Client cooperation/participation.** This includes such things as responding to the architect’s request for information (often about finishes), approving change orders, being open-minded and helpful when problems arise and even whether or not they meddle too often in daily affairs. A good owner is worth his weight in gold, and a bad owner can cause considerable roadblocks to positive productivity.

I’m sure you can think of more. Remember, the greatest tool you will own in your quest to increase your own productivity is the simple willingness to tackle the issue head on. Good luck!

**About the Author**
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