

Enabling Construction

Spring 2002



Introduction:

One of the frontiers that we face in the construction industry today is the challenge to improve our productivity performance. The amount of attention presently being given to performance enhancement within our industry could be compared to the prominence of the safety movement, of about 15 years ago. Typically somebody who was close to retirement or disabled from a workplace injury was the safety manager and their presents was tolerated, so that the industry could appear to be aligned with the fundamentals of safe work practices. A progression from this attitude has led us to the point where today's construction workers will probably consider wearing safety glasses before they cut their grass at home, a radical shift in thinking.

Productivity performance is poised in a similar position to the early days of safety enhancement. Deep down we know that we should endorse it but in our day to day lives we don't want the disruption that it may cause. This paper is a look at some of the factors that currently influence our productivity, *the writing on the wall*.

Engineering:

Engineering, Procurement and Construction are the three basic phases that a typical construction project progresses through en-route to completion. As an industry we have experienced significant advances in the field of engineering, which have challenged procurement and construction to "keep up".

One of the key drivers to the evolution in engineering has been through improvements in the field of communication. Our ability to retain and pass on knowledge gained on one project for the benefit of future projects is steadily improving. We document lessons learned and store the information in knowledge libraries that the whole world has access to. We also help develop our engineers by giving them cross exposure in both the office and the field and we encourage initiative and "out of the box thinking" to challenge them to be as good as they can be. The combination of these efforts has better enabled our engineering houses to embrace the fast track method of construction.

While this is true amongst our engineers the communication loops between engineering, procurement and construction haven't developed at the same rate. Fast track construction has increased the gap between the actions of our engineers and their consequences upon construction. A disproportionate rate of rework, unrealistic schedules and dynamic productivity factors are typically the result of the increased gaps within this cause and effect cycle.

The reality of our evolution in construction is that “fast track” will be the method of choice for the majority of our future projects. The choice facing engineering is to maintain the status quo and consider fast track and its effects as abnormal construction or to redesign our baselines so that we better enable fast track construction.



Procurement:

Procurement has for the most part been able to keep pace with the advancement of engineering. Standardized modern manufacturing methods allow procurement groups to ship materials from every corner of the globe. The human factor within this cycle is a complex variable that has sometimes resulted in inadequate communication and transfer of information, leading to incomplete orders and delays in shipping. Effective and accurate communication between the procurement group and the other two phases is an area where there is still room for improvement.

The quality and effectiveness of onsite procurement and material handling is governed by the systems employed by each individual project. The people, available space, outside influences and the demands of construction all combine to produce a system that works better on some projects than others. The key element for a productive procurement system is in focusing on meeting the needs of construction.

In an effort to minimize over ordering and system abuse procurement systems are traditionally cumbersome. Ultimately this leads to a system that serves the accounting department better than it serves construction.

As the link between procurement and construction, the onsite material-handling group should answer to construction and be responsible for material until it is installed. This would drive the development of systems that serve construction. If this were already the case we would never see bulk, hand held items bagged and tagged. This is a great example of a system that works well for procurement but is a nightmare for construction.



Construction:

The third phase, Construction, is where all of the efforts from Engineering and Procurement can come together or fall apart. One of the obstacles to constructability is that the actions and consequences of the first two phases are not closely associated in time or proximity. In other words, if a system used in Engineering or Procurement delivers an undesirable result it is here in Construction that the results first surface. The people administrating the systems in Engineering and Procurement don't suffer the consequences and often do not understand that there is a problem.

For instance, lets consider a procurement group that has set manufacturing quotas for a Fab shop to fit a schedule developed by the Engineering group. The Fab shop concludes that the only way that they can reach the targets is to restrict their production

of complicated spools to 30% of the month's totals, even though 50% of their workload is complicated spools. The initial production targets set by engineering are in tonnage or linear feet per month and are met, so the project is deemed to be on pace. The trouble starts when the constructors try to piece together a line that is missing the first spool. (One of the complicated spools not manufactured in sequence). In order to try to stay on track some temporary supports are constructed and the schedule and PF suffer. As the project progresses more man-hours are lost because other trades need to work around the temporary support and make their own variances to compensate. Now the Foreman, General Foreman and the onsite procurement group are using their valuable time tracking a spool that hasn't even been manufactured. When the spool finally arrives onsite it sits in the lay-down area for an indefinite period of time, because the onsite procurement group is too busy tracking other missing items. The piece gets delivered to site and the scaffolders have to build another scaffold in the same place that they already had one, that they recently tore down because they had to use the material to build another scaffold...and disruption snowballs in every direction.

The Procurement group review their goals and their achievements and conclude that they were successful because their target was to satisfy engineering demands; production quotas. The consequences of their actions were not close in time or proximity.

This scenario of detrimental goals is common to all the factors that deliver Information, Materials and Equipment to the field. From within this huge system of Engineering, Procurement and Construction it is easy for any of us to lose sight of what we do... we build. And within our organizations there is only one group that actually gets to do the building, the tradesmen. So for an outsider looking in at this point you would assume that the efforts of the whole organization would be focused on providing the builders with whatever they need to achieve their goals on behalf of the entire organization, (Enabling Construction). But this is not the case and our focus is on localized goals, which when joined with the success of other departments don't give us the results that we want as an industry. The true test of our focus within any team environment is to ask ourselves "what constitutes success?"



Change is one of the great frustrations for the tradesmen in the field. One of the fundamentals taught to all apprentices is that the fastest way to complete a task is to do it right the first time. A principle that forms the backbone of a tradesman's pride in quality. In order for a tradesman to work in this fashion he must have access to all of the necessary Information, Tools and Materials. When all of these elements don't come together the project stops and the tradesman moves on to another task. The disruption caused erodes at productivity but the greater cost is that we now have a project half completed that somebody else needs to resume when the missing piece of the puzzle arrives. So all of the preparation, planning, familiarization and coordination that was already done once before needs to be repeated.

Maintaining the steady flow of work in the field is the responsibility of the foremen, the general foremen and the superintendent with support from the rest of the organization. The techniques and commitment to productivity displayed by these three levels of management have the greatest influence on how productive the tradesmen can be. We have all seen examples of supervisors who command commitment from their suppliers as well as from their teams and achieve above average results because of it. Responsibility and accountability are the two key qualities found amongst our most successful supervisors. Asking the field supervisors to be accountable to a dynamic productivity factor that gets “reforecast” to match the pace of construction does not encourage that commitment.

Commitment comes from a person’s dedication to completing a task. A survey of the committed people on any project will show that the drive that gets them out of bed in the morning and their desire to squeeze more into every day is proportional to the amount of latitude that they have to control their own environment. We employ people who are driven by this desire to manage our field construction, but then we choke them with rules of conformation in an effort to maintain a minimum standard. Perhaps we should allow people to be accountable to the position that they hold and set our sights on achieving maximum results.

It is not news to anybody that the quality and experience of the people that are employed to manage our projects reflects in our performance. While a working knowledge of traditional construction techniques is still the basic requirement for good construction management, it is only the starting point. (Construction management includes everybody from the newest foreman to the client representatives).

The single greatest challenge facing our construction managers is to learn how to manage change. There will be no miraculous turn around that sees complete engineering and all of the necessary materials delivered to site before the first constructor picks up his tools. The path that we are on clearly points in the direction that will see an acceleration of engineering and procurement advances. We can be reactive to changes perceived as “forced upon us” or we can be proactive and effect the change around us.



As an industry we employ university educated engineers to design systems and qualified tradesmen and women to build quality into our projects and yet we allow all of these people to be guided by supervisors who have no formal supervisor training. The backbone of the worlds most successful companies is consistency and this is achieved through training and education, so if success is part of our vision this will have to be one of our fundamentals.

So what do we do to develop people with the management skills that will enable construction? The answer is all around us in almost every training course ever delivered; Give people the tools they need, a little bit of room to experiment and associate consequences with actions.

Construction Labor Relation’s Better Supervision program and the Construction leadership training available through NAIT are fine examples of introductory level programs, but their future success hinges on the industry support that they will receive.

By giving promotion preference to graduates the industry will encourage more of our existing and potential supervisors to seek training. Once there is a large enough portion of graduates, training could become mandatory and consistency will start to develop. Initially this could take the form of our union halls filling requests for supervisors from the ranks of Better Supervision graduates. Site specific supervisor training could be used to reinforce the same fundamentals and develop project specific skills. Of course for this to evolve our clients, construction companies and labor unions need to be on the same page. We are already very close, few people within the industry expects things to stay as they are and most key people seem to be cautiously moving in this direction. The momentum will reach the tipping point when all of the key players are publicly on board with aligned long term visions.

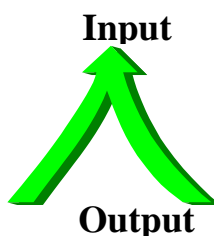
The step beyond enabling construction management is to let our builders, the tradesmen on the tools, be as good as they can be. This step in most organizations is supposed to be a natural progression once you have trained the key people.

To go here we must first understand where we are now. The construction industry is being dragged kicking and screaming behind Engineering and Procurement and this has created a certain culture on our larger projects.

The craftsmen available in any given market typically work at between 30% and 75% of their capacity. Where 29% will see you fired and 76% will see you promoted. The characteristics of the 60%+ tradesmen are high standards of quality, a drive to achieve goals, initiative and a desire for job satisfaction. The -40% tradesman are adept at doing only what they are told, focused on maintaining minimum standards and have individual goals not inline with the project.

A typical project may start out with a cross mix of 30%*s*, 50%*s* and 70%*s*. The trouble starts when we encounter delays created by the inadequate delivery of Information, Materials or Equipment. The crews are moved from plan A to plan B, C or D or maybe even plan “sit and wait”. When the missing pieces do arrive the constructors jump into action, apply their skills and complete the task. Now there is another “change” and they must go back over their completed task and change it. Each time a completed task is dismantled it becomes harder for the tradesmen to muster the desire to build the quality back in. As we repeat the scenario every day for 5 weeks we will find that the 60%+ tradesmen are becoming frustrated and the -40% tradesmen are moving into their comfort zone. After 10 weeks of these cycles the 60%+ tradesmen have either quit through frustration or have lowered their standards to suit the workload. Now repeat this cycle with every group of new-hires over a period of 6 months and we have effectively hand picked the tradesmen that we wanted...-40%*s*.

Every system is perfectly designed to deliver it's product.



Our lack of a commitment to a common organizational vision has led us to implement many systems that have a spiraling negative effect on productivity. The methods and tone that we use to communicate vision parameters (policies) are not conducive to the idea that the results of the industry reflect upon all of us. The big picture of joint success appears to be hoarded by the system administrators while the rest of the organization is treated like mushrooms. Our attitude towards communicating information sets the stage for our success or failure, as illustrated in the following example.

It is a common belief amongst the tradesmen on a typical construction project that the undesirable results achieved in the field are orchestrated by the contractor to prolong the project, increase the total marked up man-hours and weed out the guys that like to build using common sense. Why else would we build things that we know are wrong? A common by-product of our misguided delivery systems.

The real truth is that it would take twice as much effort to organize snafus, but from the tradesman's restricted viewpoint he has to try to establish why we would operate in this fashion. Once you eliminate all of the common sense reasoning the only explanation left is profit extension. So if we ask the tradesmen to align themselves with company goals and then (in their eyes) exhibit this type of behavior we can expect them to become associated with what they now think is positive behavior.

The key element missing here is the absence of information. If the tradesmen were included in the information loop and every time a change was initiated there was an accompanying explanation they wouldn't have to draw a negative conclusion due to the lack of information.

People at every level in our organizations are making the decisions that lead us to our finished product so the key to improved performance is in people. This is an answer that everybody already knows. The real question seems to be how much time, money and effort do we have to spend and in which areas.

The answer; Success will be driven by effort, so lets change the question to

“How successful do we want to be?”

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