

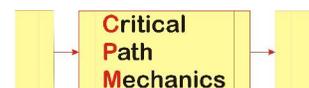
# Planners, Schedulers, Progressors and Damned Schedulers!

J. Buziak

September 20,2002

“Damned Scheduler!” This phrase is uttered far too frequently across this country as Project Managers, near the end of their projects, discover they will not complete on time. In many instances the scheduler/schedule is the readily available scapegoat for a multitude of ills associated with a project. More frequently the schedule is not to blame. When poor planning and scheduling are a valid weakness in project execution the author has found the following conditions to be largely responsible:

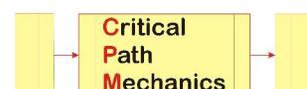
- Due diligence was done in preparation of the project plan and a useful schedule was produced, but it was never progressed and disregarded shortly after project start.
- The planning process was truncated by cloning a schedule from a previous, similar project and adopted for the current project with little modification. The schedule is progressed, but so poorly represents the scope that it is largely ignored as a management tool.
- The schedule is hacked together as the project is executed. The schedule is over constrained because the boss does not like to see the dates change. No baseline is ever set because the boss insists “You can’t really predict when you will finish.”



The facts are that few firms comprehend the total Planning, Scheduling and Progressing system. Even in large firms you will find they are good at two of three and poor at one of the key processes of the system. Large firms that have learned to manage major capital projects primarily through experience, without formal training, often do not understand there is a difference between planning and scheduling. Just as often excellent plans will be developed with accompanying schedules. Once mobilization begins the plans are abandoned and not revisited until its time to file a claim for delay or to wiggle out of liquidated damages.

One of the country's largest merchandisers builds three to four distribution centers a year, each worth more than \$40 million. This company started their own construction company several years ago in order to reduce litigation and improve schedule performance. They prepare a detailed schedule prior to mobilization then do not progress it, or otherwise modify it over the course of the project. They consistently come in on budget and schedule. Observing their performance one might be tempted to emulate them, but that is the trap many contractors fall in to.

The merchandiser has employed the same key sub contractors for many years on fixed price contracts. These are small subs which are dependent on the merchandiser for more than of half their revenue. Because of the similarity of design from one project to the next and their longevity with the prime contractor they know how the prime "...wants things done." Since their survival depends getting the next project they will go to virtually any lengths to meet schedule.

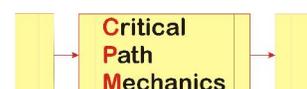


These significant advantages compensate for the prime contractor's poor progressing practices.

A comprehensive Time Management System consists of three processes: Planning, Scheduling and Progressing. Each process requires skill sets particular to each process. In order to consistently produce reliable project plans and resulting schedules each one of these processes must be addressed. How they are addressed will vary significantly from one firm to another. Small firms will limit the scope of the projects they undertake and stick with "...what they know." This simplifies planning and enables them to function with primitive schedules (punch lists). Large firms will employ scientific management techniques which are scalable over a wide range of project size and complexity. As one would expect costs increase with the complexity of the Time Management System. However, the costs associated with failing to adopt the more complex systems on large capital projects is even greater.

## **Planning**

Planning and Estimating are closely related processes. The job of the Planner is to translate the estimate into the framework of a fully developed plan to execute the project. The Planner will employ many of the same techniques used to develop the estimate in fully defining the project's scope. As the first person attempting to match the means of accomplishing the project to the requirements, the planner must have an extensive knowledge of the technology

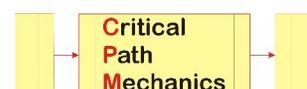


available to accomplish the required tasks. In projects with considerable technical content such as power plant upgrades and refinery work the planners will be trained engineers. Instances where the means of accomplishing the project involve public safety the jurisdiction will almost certainly require that an engineer approve the processes (such as demolition plans).

The products of the Planning process should be an Activity List with a corresponding dictionary and a fully logically connected network plan. Included in this documentation should be a draft of the tests and Quality Control points required to ensure the project requirements have been met.

## **Scheduling**

Scheduling is the process of establishing a duration and corresponding resource requirement for each activity. These pieces of data are matched up with the nodes in the network and a scheduling algorithm run to produce a schedule. This is accomplished by combining the network plan generated in the planning process in a database with the data developed in the scheduling process. Schedulers are typically database managers, highly skilled with a particular scheduling application ( Primavera Project Planner, OpenPlan, Artemis, etc.) They may also possess estimating skills and have estimating experience.

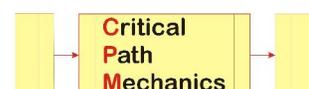


The product of the scheduling process is the baseline schedule. Once project execution begins the scheduling process may continue on an intermittent basis as errors are found or project conditions change substantially.

## **Progressing**

While schedules provide a means of coordinating the diverse efforts of an executing organization, they are more useful as yardsticks for assessing progress. Most people understand that project schedules change. The question is how much change is bad and in what direction is the schedule going. The yardstick for measuring progress is the baseline schedule. Progressing consists of updating the project database with actual results and re-running the scheduling algorithm and producing a new schedule. The new schedule is then compared against the baseline. This is done periodically until project completion and provides the only valid means for assessing progress relative to the calendar.

Progressors have largely a bookkeeping function. They annotate the database with actual dates based on input from key supervisors and managers. It is useful if the Progressor understands the process well enough to perform “spot checks” on the progress reported by the lower level managers. They may have an associates degree or at least a high school diploma. They will be functional in the workings of a scheduling application used to develop the project

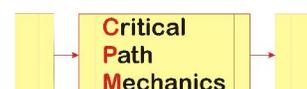


database. Frequently they are former tradesman who have an aptitude for computers and were sent to a week long CPM scheduling course.

### **Big Design, Procurement and Construction (DPC) Firms**

Ideally an organization will match the skills of the individual to the task at hand. This makes sense from both an economic and motivational point of view. Planning and Scheduling of complex projects requires personnel who are highly skilled, educated and possess a broad range of experience. Correspondingly these people are highly compensated. Progressing requires knowledge of the database application and a Technician's understanding of the processes being tracked and are less well compensated. Salaries for Planners, Schedulers and Progressors range from \$100k plus for a Master Planner to \$30K or less for a minimally capable Progressor.

In many instances personnel with a Progressor's skill set are pushed in to Scheduling and Planning roles. People who are thrown in to jobs that are beyond their abilities may initially be flattered, but in the end will suffer considerable stress when they realize they are not up to the job. On the management side the work product will be found to be unsatisfactory and label the overwhelmed employee a "Damned Scheduler!" The converse occurs when highly skilled Schedulers are pushed in to progressing roles. They will become board and occasionally jump at the first opportunity to move on to another project in the planning stage.



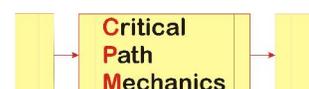
Large firms with overhead budgets in the millions can afford to retain personnel in all three classes in numbers appropriate to their workloads. Each project will likely have a skilled or apprentice Progressor. The database they maintain will have been prepared by an experienced Scheduler in cooperation with major stakeholders and under the guidance of a skilled Planner. The Project Manager need only monitor the progress of the planning team and participate in planning as a major stakeholder.

### **Small Firms**

Small firms frequently count on one really smart Project Manager, frequently the owner, who does it all. These firms take on small projects with no liquidated damages which can be accomplished employing primitive schedules. Occasionally they will try to take on larger projects using their elemental planning tools. If the delay claims, liquidated damages and cost overruns do not wipe them out, they never try another one.

### **How Can a Small Firm Run With the Big Dogs?**

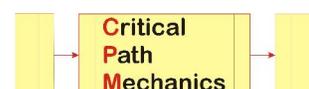
Cheap computers and the Internet can put small firms on an equal footing with virtually anyone. In the early days when scalable project management methods were first being developed their calculation intensive algorithms limited their application to very large capital projects or projects of great strategic



importance. Firms had to hire programmers to develop their own software. In the eighties this all changed with the introduction of Primavera Project Planner, Project workbench and others. Today there are numerous applications priced under \$600 which enable contractors to produce network schedules which can be defended in court.

For small firms to grow in to large firms without “betting the company” on every project they must embrace more sophisticated methods, than are typically used by small firms. An intimate familiarity with these methods can be developed by applying them on projects the small firms have already mastered. Most small businesses already have a computer that can handle the calculations. With a modest additional investment in software a small business can begin expanding their skill set in to the more capable methods of modern project management.

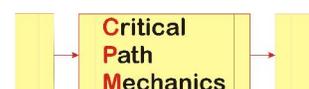
Many small firms evolve in an information vacuum with regards to management methods. Frequently they mistake bookkeeping and other fundamental accounting skills for management. Many of these skills are part of the larger skill set associated with Project Management, but they are far from all the skills necessary to take on larger projects. Fortunately there are several non-profit professional organizations which stand ready to provide support to small businesses attempting to upgrade their management practices. Foremost among them are the Project Management Institute (PMI) and the Construction Management Association of America (CMAA). Both provide certification programs and educational opportunities at minimal cost.



Most importantly for the small business, these organizations provide tested standards for the scalable methods advocated in this paper. Standards are important to the small business for a number of reasons. Adherence to standards enables success to be a repeatable outcome. Adherence to standards is also helpful as a marketing tool for small businesses. These standards and methods provide evidence to potential customers that they will get the same quality product from the small firm as its much larger counterpart.

Once the management of the small firm has identified the standards they intend to adhere to and the skills they wish to develop, Reading Programs are a simple and relatively inexpensive method for achieving those goals. Learning the “language” of the new methods can be a considerable obstacle to implementing the new methods. Even if the participants in the reading program do not fully comprehend the subject matter, the reading establishes the learning curve and begins creating the familiarity with the terminology which is essential to mastering the methods. While there may be resistance on the part of hardworking members of the firm, with encouragement the resistance should be readily overcome where there is a genuine desire to improve their work environment. Supervisors and managers who do not embrace the reading program or flat out refuse to participate may not have the appropriate mind set to be managers.

If the Information Age has brought us nothing else, it has brought us good cheap software. In the area of Project Management software there are numerous packages which provide network views, Gantt Charts and the logical relations which are required to produce a professional schedule. The fully

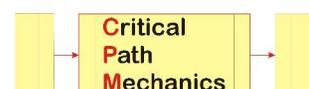


capable packages range in price from \$400 to \$600. More capable packages designed for large organizations are available for \$3000 and more. Some of the less expensive packages are designed to work as “front ends” for the larger scale packages. Adequate software to set-up and maintain an Earned Value system is available in every commercially available office suite.

Consultants are notorious for being an expensive option. Never the less, there are good consultants at reasonable prices around the country and you can find them on the internet! The Internet has created an enormous competitive market for Project Management services. Some judicious searches followed by simple interviews with the candidates can bring you to a consultant you can afford and likely has experience in your particular industry.

When engaging a consultant the small firm should have specific missions in mind. These missions could include the following:

- Detailed training in the employment of the selected software application in the maintenance of project databases.
- Estimating courses can be very useful. Many of the basic skills needed to produce a detailed estimate are also essential in the Scheduling phase. This training also provides an opportunity for cross training a scheduler to assist an estimator and vice versa.
- Consultants may also be useful in mentoring in order to fill gaps in the firm’s skill set. Such use of a consultant should be preceded by an audit to correctly identify the gaps in the skill set.

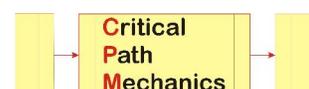


## Practice Techniques on Small Projects

The two core methods of Project Management which are essential to the small firm are Critical Path Management and Earned Value Management (EVM). The Project Management Body of Knowledge, as defined by PMI, lists a number of other knowledge areas included in the project management skill set. These two processes are distinguished by being unique to project management, where the other knowledge areas are common to other business models.

Critical Path Management (CPM) is actually a subset of the Time Management Knowledge area. The term CPM is also somewhat of a misnomer. The process for producing a CPM schedule actually focuses on defining the entire scope of work, not just selected tasks judged to be critical. The CPM's distinguishing characteristic is that the plan underlying the schedule is logically constrained. The most frequent criticism of CPM is that it is much more complex and labor intensive to assemble than a punch list. But complex projects require complex solutions. Managers who believe they can simplify a complex project to the point where they can employ their primitive planning techniques are only deluding themselves.

CPM is readily adaptable to small projects which can be accomplished employing traditional punch list management techniques. When learning to employ CPM, these are precisely the types of projects small firms should be practicing on. This enables the practitioners to see how the algorithms work and

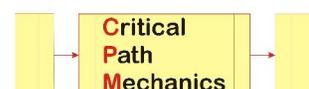


gain confidence in the results they produce. After their logical networks grow beyond a certain point it is an act of faith in the method which enable you confidently execute the method.

While the main focus of this paper is planning and scheduling, Earned Value Management is a key process which deserves mention. Distilled to its essence EVM is a simple comparison between a budget that is saved with the schedule baseline and the actual costs incurred in the course of completing the project. It is an extremely valuable tool which can help small firms ensure that they are on tract from the earliest stages of a project.

In the early days of EVM it was mandatory on major Government projects. During this period the implementation was heavy handed and bureaucratic. Thanks to authors such as Quentin Flemming and Joel Koppelman (Earned Value Project Management, 2<sup>nd</sup> Edition) it has been demonstrated that EVM can be applied to much smaller projects with excellent results. The key to efficiently employing EVM in these instances is to find the correct level of detail to integrate the accounting and schedule control systems for the firm.

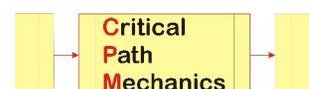
It is a justifiable criticism to say that employing advanced management techniques on small scale projects may be overkill. Attempting to master these methods on large scale projects with liquidated damages is business suicide. Small firms employing advanced methods may also be surprised to find that some of these methods can greatly improve there efficiency. This is particularly true of network planning and scheduling.



## Outsourcing?

From an implementation point of view outsourcing your planning and scheduling functions is problematic. Except for isolated parts of the country where Project Management has been recognized as a stand alone profession consultants tend to steer potential customers in to training or personnel placement. Providing planning and scheduling services is not seen as a viable business model. This attitude may be changing to some degree. In disparate trade journals complaints are being heard about the decline in the quality of planners and schedulers. As this dissatisfaction builds more consultants are certain to emerge providing this type of outsourcing.

It is also difficult to take processes which are so central to your firm's ability to perform and outsource them. It is the author's belief that it is quite possible if a firm can find a service provider they can build a long term relationship with. The key to making outsourcing work economically is buy only as much service as you need and still receive a high quality product. Most sole proprietors like to find contracts 40 hour per weeks engagements. But there may not be forty hours per week of work during many weeks of an extended project. The firm ends up absorbing this "overhead."



## Conclusion

The first step in solving any problem is to recognize that a problem exists. The folklore surrounding project centric organizations has grown up over the years so as to rationalize virtually any failure. Senior leadership in firms must possess enormous integrity and courage to see their own creations as they really are. Once the leadership of a firm has found this courage they can assess the capabilities of their organizations and implement the recommendations of this paper as they see appropriate.

