

Scheduling On Demand

Make your production schedule flexible and real time by moving from 'command/control' methods to an on-demand, real time scheduling process.

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Summary

Many industries and professions struggle with scheduling problems. The complexity, variability and sheer number of unplanned events force production managers to become reactive instead of responsive. The constant struggle for control means that the production schedule is obsolete almost as fast as it's created.

The broad problem is traditional methods for production scheduling are not dynamic and cannot accommodate changes 'on the fly'. New improved methods for dynamic scheduling allow for regular changes and accommodate multiple variables regardless of the source – it applies to any scheduling problem such as production, projects or people.

Why scheduling doesn't work

The problem with scheduling is traditional methods make it impossible to be dynamic. The method of traditional scheduling requires that the planner manually take into account several factors that are in fact too dynamic to predictably account for. Equipment failures, parts delays, order cancellations, etc. all aggregate together to make scheduling akin to predicting the weather.

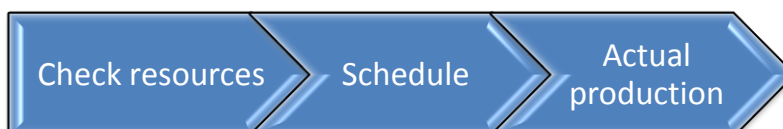
The approach of 'top down', centralized, command and control methods do not respond well to changes. Any 'pyramid/hierarchical' approach requires that information travels up the hierarchy, where a decision is made based on multiple inputs, then the information travels back down the hierarchy where the decision or change is implemented. This time delay does not work in the 'real world' of on demand production.

This is the same affliction for scheduling regardless if you are scheduling production, projects or people. So instead of trying to *control* all the dynamic variables, we need a different method that allows us to *accommodate* the different variables dynamically, in real-time.

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A different way

Traditional models of production scheduling assume production scheduling happens in sequence: production scheduling first, then actual production second.



Unfortunately, it's not a **sequence** but a repetitive **process**. Meaning a production schedule gets created, perhaps weekly, then production happens, then problems occur, then the (ad hoc) schedule gets created to respond to problems.



The implications are that the scheduling methods currently in place do not accommodate reality. The scheduling challenge this creates means that there is no real efficiencies to be gained, because you are managing a fantasy, not reality. As a result you are creating challenges for yourself because you're trying to control a process that is inherently uncontrollable. Accommodating is a management strategy that can be just as effective as control, the trick is to accommodate within boundaries that you do control.

In fact, Dick Morley, the 'father' of the programmable logic controller, also saw this same challenge in the factory floor at General Motors, so he decided to do something about it. He developed a process of 'bidding' for the paint booths that allowed them to dynamically adjust to production changes on the fly, regardless of the problem. The booths bid on the right to paint the next vehicle – the bid value is based on if they have the color already in use (paint changeovers take a lot of time to clean the equipment) and how much backlog is in the queue for the booth. In essence, a paint booth with the right color and very few (or no) vehicles in queue would have the highest bid, and then it would 'win' the right to paint the next vehicle on the line. You can read more about it in this article (<http://blog.cutter.com/2007/09/25/scheduling-via-agents>). This design approach saved \$1 Million in paint costs due to fewer changeovers.



Applications

This solution works wherever a traditional, ‘top down’ schedule exists that does not adapt flexibly in real time. Let’s briefly look at some examples.

Project Management

Adaption: manufacturing lines = projects; Paint booths = project people

One of the critical problems with projects in a large corporate environment is that too few people get assigned to far too many projects. In theory this works because projects have different start and end dates, however, ask any project person how they get all their work done and you’ll soon learn that the 40 hour work week is pure myth. This leads to false reporting of project hours which in turn, leads to false estimates for future projects. People are too overworked trying to manage to an inflexible project schedule – which does not work well in today’s fast paced business environment. Many multi-year projects have their original requirements changed several times before the project ever nears completion.

The other problem is, as stated before, is that scheduling dynamics play havoc with project planning. It’s so bad that according to the Standish Group 2011 survey:

“37% of all (software) projects ... were on time, within budget ... 42% of projects ... were delivered late, went over budget, and/or were delivered with less than the requested features and functions. The remaining 21% were considered a complete failure due to cancellation... or were never used post completion.”

<http://quotient.net/blog/2012/6/25/the-importance-of-a-great-project-manager>

The only other profession that accepts a 37% success rate is perhaps weather forecasting, but sometimes it seems easier to predict the unpredictable than manage a software project successfully.

One of the key findings of the Standish Group has been agile development methods contribute greatly to the overall success rate of software projects. So if we use a scheduling method that accommodates agile development, perhaps our overall success rates will improve. How would we do that exactly?

Let’s adapt our method of dynamic scheduling – let’s assume that projects are the production lines of the modern factory, and let’s assume that the people who work on project tasks are similar to the paint booths. The difference is that the bid could consist of 2 elements – the backfill of a person’s queue, measured by the total time to complete the tasks in the queue, and the skill or experience level of the person for the particular task. These combine to create a relative bid value in comparison to other people who could potentially be assigned to the task. Thus, as project priorities and requirements change such as in an

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agile development cycle or in complex, multi-year projects, the workload for individuals easily makes adjustments to accommodate change.

This method can dynamically reallocate workload if available more workers become available. In addition, a method of reward points can be attached for each task, these can be traded for extra vacation days, health care dollars or other, flexible rewards for working beyond a 40 hour work week. In this way, maximum flexibility can be achieved for multiple projects in each organization.

Inbound Call Centers

Adaption: manufacturing lines = Interactive Voice Response; Paint booths = Customer Service Reps

Another example could be in employee scheduling in production environments, such as a call center or help desk. The major problem with call scheduling is the workload is so dynamic and unpredictable. What if we could dynamically schedule the work based on the skill set of the task and the available workers experience? With a dynamic production scheduling option, we can.

Each employee could 'bid' on the next call based on their experience in the problem and how many callers are in their 'queue' waiting for help. This solution would have to be real time, electronic to manage the high volume of calls that come in. This of course is relatively easily managed by custom scripting your inbound call center Automatic Call Distribution (ACD) software. Your vendor should be able to assist with this.

The nice thing about a dynamic, real-time scheduling system is it potentially increases the efficiency of your available staff; by allocating calls in real time according to their skills, you may no longer need to insist that call times be kept low, and first call resolution can increase dramatically. The other benefit is that people can increase their skills in real time because dynamic scheduling will spread the workload fairly and efficiently, in real time.

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Next steps

I would be delighted to discuss applications to your scheduling nightmares. Please call me at 612 819 1803 or alanhill@srkinc.com

