Increasing Capacity
Face-Off: Infinite versus Finite Scheduling
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The Master Scheduler. Production Planner. Lord of the Shop Floor Calendar. By whatever title you call your employees in charge of the production schedule, this position is critical to the success of your plant. Your manufacturing business lives and dies by the effectiveness of your master production schedule, making the role of scheduler an unenviable position. It requires a deft hand and comprehensive knowledge about every work center, job type and operator on the floor, leading some to consider the process of advanced planning and scheduling as more of an art than a science.

The Master Scheduler is constantly maintaining the balance between work center capacity and demand. To complicate things, the scales are continuously being tipped by both internal challenges (such as unplanned downtime, unexpected number of rejects, changeovers, operator absences and bottlenecks) and external variables (including cancellations, changes in priority (urgent orders) and forecast alterations).

A good Production Planner has a few cards up his sleeve to manage capacity and demand modifications, such as overtime, subcontracting, batch splitting and stock inventory, but the greatest tool is the scheduling program. Of all the scheduling methods out there, which one is best for your shop floor?

The Three Most Common Levels of Scheduling Tools

Level 1 - Basic: At the most rudimentary level, schedules for the shop floor are created from spreadsheets, white boards and dry erase markers. Manual and untimely, this cumbersome method of planning production involves a heavy amount of proprietary knowledge and a reactive juggling act. Schedulers at this unappealing level should more aptly be titled seasoned firefighters. In today’s comparison of scheduling programs, this one doesn’t even make the list.

Level 2 - Infinite Scheduling: Production Planners at level two have advanced to an electronic system. Still
somewhat limited, these systems can typically run MRP, generate work orders and assemble a dispatch list. The scheduler can sort by required date and apply rough cut capacity to estimate the order jobs should run, but a major challenge encountered at this level is the assumption of infinite capacity. Scheduling tools at level two only consider the expected production time and there is no concept or relation to what is actually occurring on the shop floor. Scheduling decisions are made on a daily, rather than hourly, basis. These limitations make it difficult to respond to changes and manage resources. Most ERP vendors offer built-in functionality at this level or offer a bolted on third-party program.

Level 3 - Finite Scheduling: Welcome to the Ferrari of scheduling tools: Finite Scheduling. Unlike the above, Finite Scheduling offers a realistic model of your shop floor and recognizes actual plant capacity limits in real time. It is comprehensive and part of the core ERP software, automatically taking into account material constraints, BOM complexity, WIP processes, tooling conflicts and priority orders, while simultaneously evaluating the resources required to meet demand and allow for unplanned events.

The cornerstone of finite scheduling is its real-time capability. In an advanced finite scheduling tool, you receive up to the second progress about how every job on your floor is performing. Rejected parts, production time remaining, actual cycle time instead of average cycle time, etc. is all being displayed and refreshed as it is occurring. Scheduling decisions are made in real time, with flexibility to easily adjust the schedule at any moment.

Which One Manages Increases in Capacity Better?
An upturn in the economy has brought a welcome increase in manufacturing demand. When faced with a surge in business, manufacturers are seeking ways to increase capacity and the right scheduling program can help greatly in this area.

With infinite scheduling, shop orders are traditionally suggested and released from MRP, which assumes infinite capacity. If overscheduling of work centers and machines
occur, then they are dealt with on an exception basis. But when companies shift into growth mode, overscheduling begins to happen on a regular basis, leading planners to pad the schedule and sending utilization heading in the wrong direction.

An increase in capacity is where finite scheduling shines because schedules created based on actual capacity are far more accurate. The advantages of knowing instantaneously what is happening on your shop floor are immense. The benefits of finite scheduling include:

- More predictable lead times based on accurate, real-time evaluation of your jobs
- More optimized use of available resources, including material constraints, work center uptime and labor capacity
- Lower inventory levels and minimized production costs as materials are only ordered when they are needed
- Demand driven, more reliable on-time delivery for increased customer service
- Notifications and exception messages for increased business activity monitoring and proactive decision making
- The ability to automatically “smart load” your work centers based on historical performance data, ensuring that you are optimally using your assets

In the face-off between infinite and finite capacity, the winner is clearly Finite Scheduling! But beware: While some ERP vendors claim to offer finite scheduling functionality, it is commonly not automatic and does not offer actual real-time feedback. Real-time information should be collected on the shop floor and updated in your scheduling tool instantaneously, not in batches every couple of hours. When evaluating ERP and MES solutions, be discerning. Selecting a comprehensive software system with an advanced scheduling tool may be one of the most important decisions you make when it comes to improving operational efficiency in your business.

If you would like to learn more about IQMS’ comprehensive ERP solution, please visit www.iqms.com.