

Promises Kept:

Creating Flexible Production Schedules Without Sacrificing On-Time Delivery

Best practices for unlocking the full power of ERP in confronting and overcoming unrealistic delivery dates

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The business community has long embraced the notion that it is easier and more cost effective to keep a current customer than find a new one. Following this pattern of thinking, the importance of a manufacturer to keep its promises in regards to on-time delivery and other production-oriented timelines becomes obvious.

Supply chain gaps, equipment downtime and other unforeseen issues often pit a rigidly-constructed production schedule against promised delivery timelines. So instead of optimizing plant resources, including those embedded in their ERP system, in adjusting to these obstacles, plant personnel are tempted to sacrifice operational efficiencies and data-based decisions in order to keep the schedule on track.

While these approaches can provide short-term relief, the long-term impacts can be equally devastating, ushering in practices that undermine quality controls and eat away at more cost-effective programs and approaches.

This white paper will offer insight on ways to properly utilize all the resources within an enterprise to ensure that initial schedules are designed with a flexibility that allows for maximizing efficiencies, minimizing costs and maintaining quality without extending delivery times.

Setting Up For Success ... or Failure

It would be difficult to imagine a production process that was not established with the best of intentions. Operations and quality assurance engineers take a number of factors into account, including inventory management standard operating procedures (SOPs), historic supplier capability metrics, labor resources and much more in establishing key performance indicators (KPIs), goals and schedules that will meet customer delivery expectations.

Establishing final delivery dates is one thing. Establishing reasonable, data-based final delivery dates can be another. The place to start is by accessing all the available supplier, inventory and production data available. Reviewing the information found in enterprise resource planning (ERP) and manufacturing execution systems (MES) platforms provides visibility on a number of fronts that will impact an enterprises' ability to meet promised delivery dates.

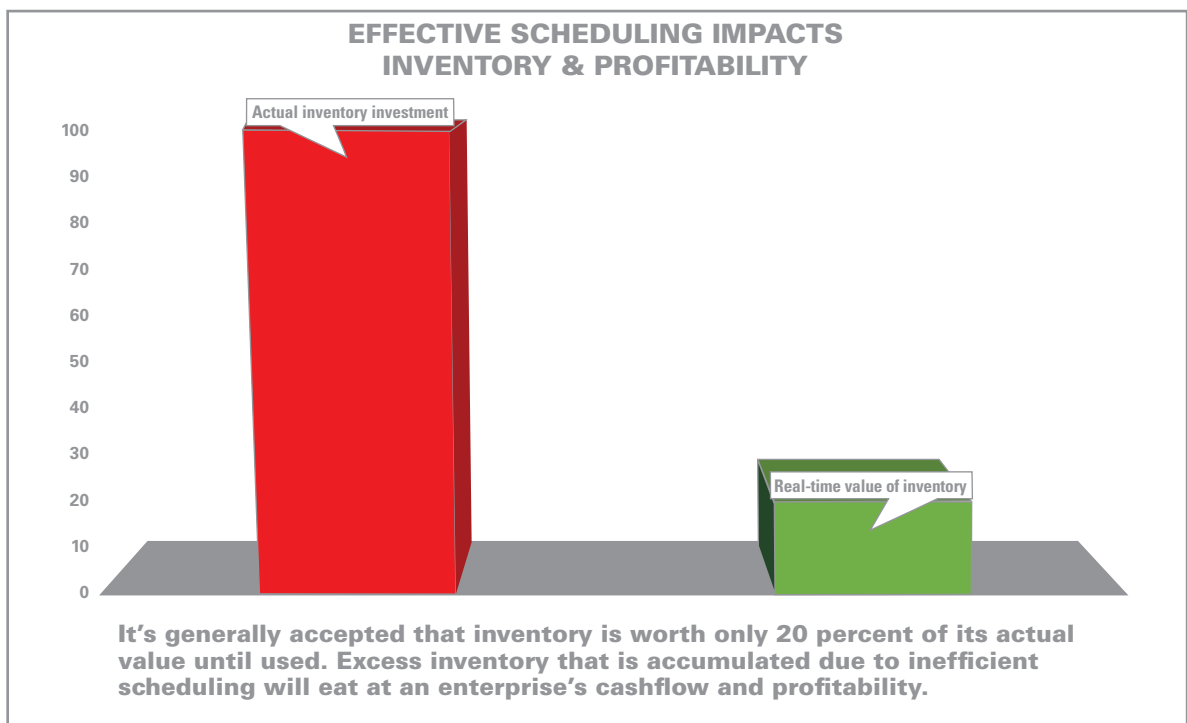
One of the greatest advantages these software tools offer, with their enhanced access to vital supply chain, labor and inventory data, is the ability to provide manufacturers with a more flexible, proactive approach to schedule creation. Instead of establishing timelines based solely on customer demands, embedded flexibility can come from pro-actively analyzing ERP data, preparing for the potential production obstacles they help visualize, and then generating schedules that meet the goals of both internal and external stakeholders.

Looking at current and historical information related to inventory management and fulfillment also saves time when compared to manual approaches. The automated data functionality inherent to these platforms ensures more accurate scheduling criteria is used, with these functions performed more quickly and with greater attention being paid to those elements that can detract from the primary focus of a schedule – hitting the delivery deadline with accurate projections while ensuring a high level of product quality.

This proactive, automated element can be seen in a number of plant operations and planning functions, including purchasing. In many instances in-bound inventory and purchasing management is driven by comparatively manual processes, i.e. when the shelves are light, it's time to buy more.

However, by fully utilizing the market data and automated inventory management tools housed within the ERP system, purchasing professionals can allow these tools to paint a clearer picture of when they should buy, when new purchasing agreements need to be approved, and how all these factors stack up against production schedules and key deadlines.

These tools can make purchasing less time-consuming and keep everyone in the loop as things change. Syncing purchasing with scheduling allows the plant floor to make changes, with purchasing fully aware of what is happening. This ensures materials and components arrive when they need to, not ahead or behind the revised schedule. This creates embedded scheduling flexibility without cutting into costs or creating inventory management challenges.



Scheduling To Promise

Limiting the impact of factors detrimental to production schedules is perhaps the most valuable operational facet that these software tools can provide. But perhaps more important than the information embedded within the ERP software is having a working knowledge of what this information means and how it can be accessed.

This makes training on data sets like ATP (available to promise, which provides visibility on material or component availability) and CTP (capable to promise, which extends ATP by taking into account capacity, giving a more realistic picture of whether demand can be satisfied within a given time-frame) crucial. Understanding and properly implementing these data sets can help guide the front end of the production process, i.e. order taking and customer service. If these individuals have a better understanding of all the variables impacting throughput, not just standard lead times, that can ensure customers are given realistic delivery dates.

Being able to run a CTP study on delivering X pieces by X date is better than looking at either real-time data that will fluctuate over time, or depending on historical data that needs to be configured manually. This knowledge can then be supported, as opposed to being the sole basis for the delivery dates being created, via an understanding of lead times, routing hours and bill of materials information. Following this process, schedule creation is based on having the right recipe, based on the right data. Additionally, there can be enterprise-wide confidence in meeting timelines because these schedules contain enough flexibility to handle supply chain, labor or inventory disruptions. And it all starts with optimizing the capabilities of the ERP system.

This information, and an understanding of how to properly utilize it, can also provide greater scheduling visibility and a knowledge of when to properly source different materials, supplies or components. Cash flow can be reserved and resources allocated at the right time so that if the schedule changes, manufacturing is not stuck with expensive inventory too far ahead of time, eating into resources that could be used in other areas of production.

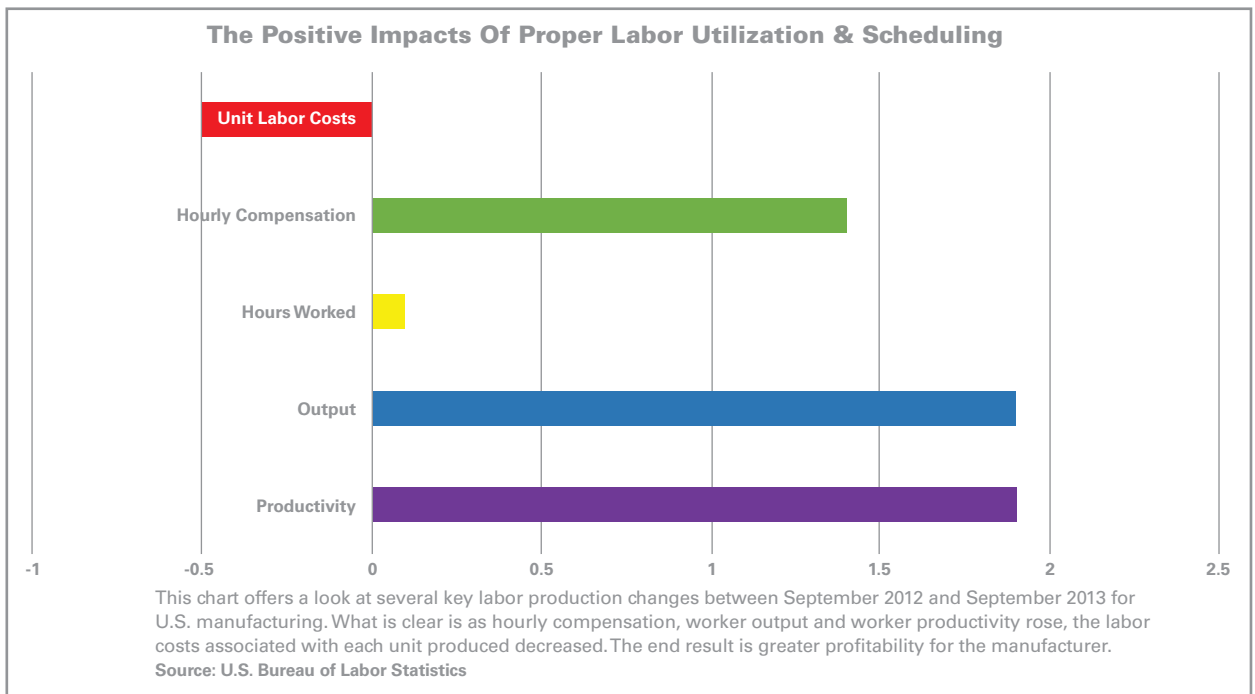
Competitive pressures will always present the temptation to over-promise, but this short-term win can result in long-term customer dissatisfaction and retention issues if the end result is under-delivered (use this as a pull quote on either this page or the one following). Additionally, the temptation to construct difficult or potentially unrealistic schedules can paint manufacturers into a corner if issues up or downstream from the plant arise.

So in addition to understanding the potential capabilities of the supply chain, proper planning must equally account for supply chain risks. This allows for establishing timelines based not only on historic performance, but current marketplace inventory levels and fluctuations in consumer demand. All of which can be best understood by knowing where to look in the ERP system and then responding in accordance to what the data shows.

What You Have To Work With

In addition to the data housed within its ERP system, a manufacturing enterprise has a number of resources at its disposal to help meet its goals. In giving a production schedule the proper structure it deserves, machines and people, as well as interwoven conditions like set-up times, need to become a working component of the planning process. Understanding the constraints and opportunities possessed by each resource is key in establishing realistic production timelines and delivery dates.

One of the most critical resources is labor. Labor's role in keeping production schedules on time is obvious, but some of the different facets it encompasses are not as transparent. Reporting labor hours, as they relate to particular processes or number of pieces that can be completed in a given amount of time, and the costs associated with these operations, all need to be properly tracked in order to construct accurate and cost-effective schedules.



In particular, one key element of tracking and reporting labor data involves developing and consistently inputting standard labor rates, as opposed to real-time rates. Real-time rates can fluctuate and not provide enough flexibility in the schedule. Standard rates, based on historical data, allow for adjusting to some of the fluctuations in labor that will inevitably impact production schedules. Using the proper data set is vital in establishing realistic timelines and projecting the associated costs.

In keeping with the human factor of plant resources, many distributors and most suppliers will work with manufacturers in helping them streamline inventory management and procurement. While leveraging these relationships is certainly one of the most cost-effective resources available, it is also one of the most under-utilized.

Whether it stems from a lack of trust, concerns about additional costs, or a difficulty in finding a common vocabulary, manufacturers and distributors usually encounter significant communication issues when the conversation goes beyond product, price or delivery date.

However, sharing operational knowledge or supply chain management best practices, and getting to know more about each other's products and services can have far-reaching, positive impacts. Exchanging scheduling information with suppliers and providing details about critical stretches in the production schedule can help buffer a number of potential disruptions and help keep more delivery date promises. Again, much of this information can be found in the ERP system, with easily customizable reports designed for sharing key sets of data but without providing access to privileged or confidential information.

Planning To Stay Flexible Fluid

A favorite saying amongst trainers in the military involves the importance of remaining fluid – because flexible is too rigid. There are definitely some similarities when comparing the dynamics of manufacturing production schedules.

Simple in nature, but more complicated in execution, is the implementation of contingency planning when targeting greater production schedule flexibility. Continuity or contingency plans can address a number of factors relevant to supply chain (single versus multiple sources for components or materials), equipment (what happens in the event of a maintenance issue), or labor (strikes, rate increases, etc.).

All of these factors, and many others, can have a negative impact on production scheduling if they are not accounted for and planned against. Alternatives should be identified in every facet of production – whether the nature of the disruption can be planned for or not. Schedules need to have inherent flexibility for responding to changes as they happen.

It's also important to remember that some of these changes can be positive. On rare occasions production may be running ahead of schedule. Implementing contingencies for alternative production flow that still allows for optimizing the situation can help compensate for other, yet-to-be-seen situations that may arise later in the schedule.

Another area that begs for contingency planning is logistics. Whether it relates to materials coming into your facility or end-product going out, having alternative options will help preserve final delivery dates, ensure profitability and maintain customer relations, regardless of the source of the disruption.

ERP data can also help logistics operations by automating the transfer of customer data and payment information to ensure products and materials are delivered without delay. The end result is the customer getting their product by the date they were promised because alternative options were previously identified and then mobilized in the face of possible disruption.

The need for greater flexibility in production scheduling stems from an overabundance of unrealistic timelines. A mentality of "the customer always being right" can lead to short-cuts that sacrifice workflow efficiencies and proper equipment maintenance. The end result is an overall approach that proves detrimental to company goals.

In the military, a fluid approach is mandated because of on-going changes to the environment, resources, personnel and mission expectations. Similarly, while everyone in the manufacturing environment can appreciate the need to satisfy customer demands and make the most of opportunities that arise in tougher economic times, unrealistic scheduling can end up hurting more than it helps. This is especially true if product quality is impacted even slightly. If work needs to be re-done due to scheduling short-cuts, throughput is reduced and delivery dates will not be met.

Not only do rigid, unrealistic timelines hinder manufacturers from an efficiency standpoint, but, potentially from a cost perspective as well. So whether we call it “fluidity” or “flexibility” it is imperative that an elastic approach to scheduling is implemented. A lack of fluid approaches and planning can negatively impact a number of other companies throughout the supply chain. Suppliers and distributors now face added delivery pressures that could result in higher pricing, less value-added service and greater fluctuation in their inventory, which all gets passed along to manufacturers. In this instance, a lack of fluid planning approaches can place the goals of several organizations at risk.

Putting Everything In Place

Even the best laid plans can falter if they are not properly executed. So after reviewing all the ERP data, establishing these schedules and putting the necessary contingencies in place, it’s obviously important to stick to them – even as the inevitable obstacles arise. Ensuring proper implementation of these production schedule procedures ensures that no short cuts are taken and on-time delivery is achieved.

One of the areas in which organizations struggle is simply being confident about the delivery dates generated as a result of following the steps previously mentioned. Everyone from the plant floor to the front office needs to know that this date can be hit because the processes in place provide the capabilities needed to adjust for any disruptions in meeting deadlines.

So when internal or external issues arise, all involved need to understand the importance of sticking with the schedule and all the planning that it encompasses. Adjusting or panicking at the first deviation will negatively impact delivery date, cash flow and all the operational efficiencies that were considered in establishing the schedule.

Once production begins, there are a number of potential red flags that should signal the need to change or adjust, based on the contingency plans that were established. One is capacity constraints, which could relate to machine availability or throughput. If a machine is not keeping with scheduled demand, a bottleneck can be created that slows down the entire operation.

Identifying these constraints, with the assistance of ERP data, as quickly as possible allows for looking more critically at workflow and then making the necessary changes. This could entail adjusting the schedule of a particular machine or work center in maximizing its use.

Optimizing that constraint can set the pace for everything else, so focus on that key constraint in adjusting the schedule. Implementing root cause analysis procedures will also be vital in figuring out what’s producing the potential threat to your delivery date, and working to pro-actively eliminate it.

Remember, however, that shifting critically constrained resources could create another bottleneck somewhere else. So constantly tracking production flow to stay ahead of any potential issues will be key, especially because people factors (in terms of labor hours, the number of people needed for a given process, overtime and pay rates) will play a key role in both creating and addressing current and potential constraints.

Throughout this paper, the need to hit timelines without sacrificing quality has repeatedly been addressed. Another strategy that supports this dynamic is integrating process checks as part of the formal structure of the schedule. Empowering employees within critical work centers to reject end products and initiate immediate non-conformance actions will ensure quality standards are being upheld. Combining this ability with the inherent flexibility of proper scheduling driven by a visibility of ERP data keeps all company and production goals focused on maintaining a manufacturing enterprise that is equally focused on service and revenue.

Conclusion

The takeaway values from strategies focused on resource utilization, flexible scheduling and the usage of supporting ERP data is that promises will be kept, suppliers will be happy and customer expectations will continue to be met. While competitive pressures will always pose a threat to proper scheduling, this paper hopefully demonstrates the benefits that can be realized from “sticking to your guns”

Keeping your delivery date promises originates with a production schedule that provides the necessary flexibility and integrates the right data. This is not always the easiest or simplest route to take, but it will end up being the most efficient, the most profitable and the most successful for both the manufacturer and the customer.

About the Author

Jeff Reinke is the editorial director of *Manufacturing.net* and the Manufacturing Group at Advantage Business Media. This group includes *Industrial Maintenance & Plant Operation (IMPO)*, *Manufacturing Business Technology*, *Industrial Distribution*, *Pharmaceutical Processing*, *Food Manufacturing*, and *Chem.Info*. He can be reached at jeff.reinke@advantagemedia.com.

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