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# SPEED TO MARKET

A Newsletter for  
Job Shops–Niche Manufacturers–Focused Distribution Systems  
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## Job Shops are Easy to Manage...Not!

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**Speed to Market Readers** may recall the lament by a manager who made the transition from a mass production, build-to-stock environment to a job shop. He was totally frustrated by his inability to make changes that would produce bottom-line results. In case you missed it in the [July 2005](#) issue of the STM Newsletter, here are his comments:

*I am the VP of Manufacturing for a privately owned machining job shop. After 23 years with Motorola, I thought I could help improve any kind of manufacturing process, but I was wrong. I have had much training in JIT, Six Sigma, TPS, Kanban, Lean, Continuous Improvement, and some Black Belt courses.*

*I am struggling with making quantifiable improvements that show up on the bottom line. Currently we are a small team of individual players! The organization has been together for 20+ years and the "old" mindset is "Things will never change." I've introduced ideas with the support of the owner only to have them fade after a few days with little impact. I most often get sucked into the daily tasks of the business, thus causing even myself to let ideas drop by the wayside.*

*I was hired with only one real expectation.... improve the bottom line. I have not really accomplished anything in the past 12 months, and fear my position is short lived if I don't find the "Correct Path" to lead the team down.*

*Has anyone out there had these problems and pulled through? Please advise, I am open to any suggestions. Best Regards, Tom*

Tom's experience is not unique. "Transfer managers" often underestimate the difficulties of managing a job shop. Typically, they are smaller than the mass production environments from whence they came, and they tend to equate small with easy to manage, especially when it comes to making improvements that will yield financial results.

**What makes job shops so difficult to manage?** This article explores some of the unique characteristics of these types of businesses, and implications for managing them.

**I. Feast or Famine:** A primary characteristic of job shops is the feast or famine, roller-coaster nature of demand. Job shops are order-driven, service businesses that produce to exact customer specifications. Unlike mass production operations where orders are disconnected from production, job shops have no work if there are no orders in the backlog. You can't build ahead because you don't know what you will be making.

**Note:** Job shops that book blanket orders and release against these are a separate case, and have their own set of problems. For more on this topic, see [Contract Manufacturing: A Variation on a Job Shop Theme](#) in the August 2004 Issue of *Speed to Market*.

**II. Variation in Demand:** Although job shops tend to specialize in particular types of products (e.g., general machining work, dies, molds, millwork, fabricated assemblies), variations in these areas can be extensive. There may be significant engineering or design work required, and different orders require different production routings. This requires a fair amount of thought and often experimentation, which is not necessary in a mass production operation with repetitive operations.

Feast or famine, and the variation in demand, have implications for level loading, capacity management, pricing, production, scheduling, and staffing.

**a) Level Loading:** Roller coaster demand prevents level loading which is a traditional manufacturing technique for gaining efficiencies via consistency. Level loading implies a known amount of work with standard times, so it's easier to establish the proper crewing and run time required to accomplish a known amount of work. You will have a hard time level loading when your input fluctuates, and customers and competitive conditions dictate your ship dates.

**b) Capacity Management:** Roller coaster demand also makes capacity management more difficult. In times of high demand, you must bring additional capacity on line, otherwise your lead time will stretch out, your customer service will suffer, and you will become increasingly less competitive with other shops that can deliver more quickly. On the other hand, in periods of low demand, you have an excess of (non-productive) resources for which you are paying. For more on managing capacity in an order-driven environment, see the article "Do You Know How to Play the Accordion?" (In [A Primer of Job Shop Scheduling](#).)

**c) Pricing:** Work must be estimated and priced to win bids and make money. A too high bid and you don't win the work; a too low bid and you lose money. Estimating is not an exact science, and the variation in demand makes accurate estimating difficult. Compare this to a mass production, repetitive operation where time and materials requirements are calculated to the second decimal point.

There is also a great temptation to reduce prices to win work when times are slow. The problem with this strategy is that you can fill your shop with unprofitable work, and then have no capacity left for higher margin work when demand picks up. For more on this topic and how to use your Weekly Performance Report to anticipate demand, see [The Ins and Outs of Job Shop Quoting](#) in the August 2005 issue of the *Speed to Market Newsletter*.

**d) Production:** Variations increase the probability of mistakes and added costs. Not every order is estimated and routed correctly, and even minor errors can add to rework and scrap costs. Again, mass production manufacturing has the advantage of having the bugs worked out of production during initial runs.

**e) Scheduling:** There are a variety of reasons that scheduling is one of the most challenging aspects of managing a job shop. Typically, these involve changes initiated by customers, inaccurate estimates that keep jobs in work centers longer (or shorter) than anticipated, outsourced work that does not come back on time, rework, and more. We have written about this extensively in Chapter 8 in [Speed to Market: Lean Manufacturing for Job Shops](#), as well as in a wide variety of articles that are included in [A Primer of Job Shop Scheduling](#).

**f) Staffing:** It's not a simple matter of laying people off when demand is down because you will very likely need them in the next couple of weeks, and skilled trades people are not easy to replace. Therefore, you try to maintain your workforce hoping that the downturn will be short lived.

**III. Customer Involvement:** A third major characteristic that makes job shops difficult to manage is that customers are typically involved throughout the production process. When you are building a custom product, whether this is a die, a specialized machine, or a piece of custom cabinetry, there are certain points in the process that require customer inspections and sign offs. Often, there are engineering changes that disrupt progress, and sometimes work is put on hold because the customer's customer is having difficulties with timing or money. The point is, the customer plays an integral role in the production process, and this can create countless difficulties that slow progress and increase costs.

**Note:** A high degree of customer involvement with changes in product specifications and production schedules creates a need for a more highly developed communications system (formal and informal) in job shops. These types of changes affect many people inside and outside the organization, and it's a challenge to keep everyone informed. You might want to look at this as an area for improvement.

This is very different from the relationship between customers in a mass production business where you never see them. Customers, in the form of market demand, are indirectly related to what happens on the shop floor. Products are built to inventory, and inventory levels are adjusted based on aggregate demand, not individual customer requirements.

**IV. Planning for Growth:** A fourth characteristic of job shops is the difficulty of planning for growth. You may have a run-up of business that looks like it will continue, but then again it may fall off. Should you expand or not? Should you buy more equipment or not? Should you hire more people or not? These are difficult, sometimes risky decisions that hinge on uncertain market demand that may be impossible to predict with any degree of certainty, especially if you are dependent on a small number of customers.

**V. Equipment Utilization:** Equipment utilization is a typical measure of performance in a mass production environment where much of the work is machine paced, and lines are engineered to produce similar products at a high rate of speed.

However, in a job shop environment, you may have a machine that has a very low level of utilization, yet must be available when you need it. Equipment selection is not necessarily a function of how much you will use it; rather, a specific piece of equipment may be required to reduce lead-time, or reduce outsourced work and associated costs. You may have a hammer in your toolbox, but that doesn't mean you have to use it all the time.

We were delivering a seminar recently, and one of the attendees who ran a steel distribution center (order-driven business) came up during the break to chat. He had been working with a lean consultant who told him his saw was underutilized (part of their service was to cut steel to customers' specifications). He wanted to know what to do to increase utilization.

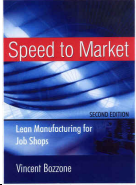

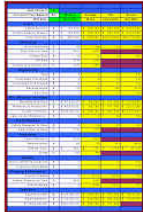
Now we were sorely tempted to tell him to cut up every piece of steel in the place in order to increase utilization of his saw. Instead, we were nice, and explained the concept of utilization in an order driven business. We told him the best way to increase utilization of this piece of equipment was to sell more steel to more customers, and to merchandise his value-adding service.

**Summary:** Many people underestimate the difficulties of managing a job shop. Small does not mean easy to manage. (This is not to imply that mass production operations are easy to manage either; it's just that job shops tend to be underestimated because they are smaller.) Feast or famine and variation of demand are primary characteristics of order-driven businesses, and have implications for capacity management, scheduling, staffing, production efficiencies, pricing, equipment utilization, and more. Additional challenges come from the close relationship with customers, communication demands, and planning for growth. This is not a complete picture. I'm sure readers have more to add. We would welcome emails illustrating other characteristics of job shops that create management challenges.

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**Don't forget to visit the Delta Dynamics Store where you will find**

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	<p><b>Speed to Market: Lean Manufacturing for Job Shops 2<sup>nd</sup> Edition</b></p>	<p><b>A Primer of Job Shop Scheduling</b> Eleven Articles 40 Pages</p> <p style="text-align: center;"><a href="#"><u>See Table of Contents</u></a></p>
	<p><b>Speed to Market Training Program</b></p> <p><b>DVD with Speed to Market book, plus a Companion CD with PowerPoint Slides &amp; Implementation Guide</b></p>	 <p><b>Weekly Performance Report Software with Speed to Market book and Implementation Guide</b></p>

# Can Your Scheduling System Do This?

After a rigorous and extensive development and testing period, Delta Dynamics is now installing a *Production Planning, Capacity Management, Scheduling, & Shop Floor Control System* for job shops. Compare Your current system to this comprehensive approach.

Capabilities and Benefits Compare to your System	Y/N
1. Provides visibility of all booked orders and their promised ship dates.	
2. Maintains an accurate real-time picture of the workload (backlog) on the shop in total and by work center.	
Prioritizes these orders by ship date by week (and by day of necessary).	
4. Provides forward visibility so that capacity requirements can be anticipated	
5. Provides ample warning when an overload condition exists so that additional capacity can be brought on line	
6. Provides an easy way to identify when and where a job has exceeded its estimated hours by work center. This enables the Production Supervisor to take immediate action to determine the problem (miscalculated estimate and/or a production problem on the floor).	
7. Enables the Production Supervisor to schedule employees in work centers based on backlog hours and their skills.	
8. Enables managing fluctuations in the shop workload with greater efficiency, including spikes in demand & unanticipated emergency orders.	
9. Provides a method for adjusting capacity to match workloads at individual work centers.	
10. Establishes workload priorities based on customer service requirements.	
11. Maintains consistent lead times with variable demand.	
12. Enables supervision to determine overtime requirements at the start of a week instead of at the last minute.	
13. Enables supervision to identify the need to outsource work during periods of peak demand.	
14. Identifies training needs among members of the workforce and track their progress in learning new operations.	
15. Interfaces with ERP systems like Vantage, JobBoss, E2, Coss Systems, and others.	
16. Provides the shop floor supervisor with the visibility and tools required to change the lineup behind each work center at a moment's notice to reflect changes in priorities, and to control work on the floor with greater precision.	
17. Provides employees with a forward look so they can plan their time more effectively (vs. getting last minute assignments that can be disruptive to family obligations).	

**If you are having scheduling challenges, and are looking for a system that has these capabilities, give us a call at 248 333 0482.**