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typical solutions don't work.



# The 9 Challenges to Scheduling YOUR Job Shop and Why Most Schedules are Dead on Arrival! How you can conquer these challenges and get on-time!

## By Dr Lisa Lang

Why is it so hard to schedule and run a custom job shop or machine shop? Why is it so hard to get jobs out the door and be 99% on-time, all the time? to maximize productivity and reduce lead-times?

We're going to answer those questions in this report and then investigate the solution. Because we know (for sure) that our performance is a critical aspect in achieving customer satisfaction, loyalty and greater sales.

## The 9 Biggest Challenges ...

I recently surveyed 1,500 NTMA (National Tooling and Machining Association) machine shop owners about the biggest challenges they face when trying to schedule their shop. And then I spent countless hours going through the data.

I learned a lot and I really felt your pain. And it brought back memories of when I managed and then owned a shop.

Based on my survey (and from owning my own shop and from many of my job shop clients and those I meet while Dr. Eliyahu Goldratt's Global Marketing Director) I can say this... you are not alone.

I could categorize ALL of the responses and my experience into 9

challenges that make running and scheduling a custom job shop so hard. So let's go through each category ...

#### 1. Clients change their mind

Customers often want to make changes after they have placed their order. They want to change their quantity, change the scope, change the design, cancel, or ask you to give priority to another one of the jobs.

In addition, customers often have emergency needs. And big or important customers always seem to pick the time when you're booked solid for 3 weeks to call and request that you slip their job in this week so that they can meet a commitment to *their* customer.

So, we break a setup, we jump through hoops and do what we need to do to keep the customer happy. But we are now late on another customer's job. And now the schedule is out of date.

And sometimes, they don't want to make a change, but they want to check in with you to make sure your going to finish their job on-time.

And, we hate answering the phone.

## 2. Vendors are not always reliable

Raw material suppliers, particularly for less common materials, can extend or vary their lead-times and then still don't always deliver when promised.

In addition, outside process vendors like platers, heat-treaters, welders, and the like also have a hard time meeting their original commitment. And the amount of time they end up taking varies based on the load on their facility so you can't even begin to predict.

So as soon as one of our vendors misses their commitment, our schedule is out of date, and we now may be late. And when it finally shows up, we find ourselves breaking a setup and expediting because

THAT customer just called.

And, these guys seem to schedule based on who's screaming the loudest, so we need to call and scream on a regular basis for any important jobs. This isn't very productive work, but it's necessary.

#### 3. Our mix can vary wildly and so our constraint moves

It seems that the nature of a job shop is that your mix is going to change, and due to that your constraint (your Herbie<sup>1</sup>) is going to move. And, it's hard to improve a moving target and improving everywhere is just plain unaffordable.

Job shops and machine shops can range in the amount of repeat work they do. And the more custom work they do, the more the mix can change day-to-day or week-to-week. And sometimes "the mix gods" are good to us, but sometimes they're not and we don't ship on-time.

But shops that do a large amount of repeat or make to stock work don't have it any easier -- they are trying to balance against an unknown and ever changing forecast. And when the forecast is wrong, we need to break setups and expedite.

# 4. My employees do not always have the right skill and their discipline is lacking

Job shops universally seem to lack skills amongst their employees. Certain people have to run certain jobs. Not everyone can do a setup, or not everyone can do certain setups. I've heard some owners refer to their less skilled labor as button pushers or part changers.

This means that the skilled people always have a backlog of work while we chase around and find something the button pushers can't screw up. And finding the time to cross train is difficult.

And in addition to these skill issues, people don't always show up on

 $<sup>^{\</sup>mathrm{1}}$  Herbie is the boy scout from the book *The Goal* by Eliyahu M. Goldratt

time or at all. Or they show up, but you wish their attitude would have stayed home...getting buy-in is difficult at best.

I was always (and continue to be) amazed and bemused about how employee's behave. I'm an engineer and they don't seem to adhere to any logic that I understand.

### 5. My processes are not reliable

Even jobs that repeat can have large differences in set up and run times depending on who is running it or what machine it runs on. But even if we can get the same guy and the same machine each time, stuff happens -- tools break, fixtures don't work, machines or tools aren't calibrated, etc.

And then we win a new job, one we have not run before. And, of course, it doesn't run anything like what we planned or based our pricing on. Stuff happens.

Our front office or pre-manufacturing processes are not much better. This means that some of the time we don't always have what we need to run the job -- the raw material, the design, the order into the system, the programming done, etc.

And when stuff happens (or more correctly when variability happens) we are in jeopardy of delivering late, which causes us to expedite, which means our schedule is out of date.

#### 6. Machines break down

Of course, on occasion, machines break down. It's difficult to schedule maintenance when you're always behind schedule. And it seems to happen when we're slammed. And then our schedule is out of date, we are in jeopardy of delivering later, and so we again expedite. (We're getting pretty good at this fire fighting and expediting.)

#### 7. Quality is not near perfect

Quality isn't always perfect. Sometimes we struggle to make it right the first time or don't catch a mistake until further processing has been done. Regardless of whether we spend time doing rework due to an unpredictable downstream activity or an unsuccessful tool tryout the result is we are in jeopardy of missing our due date, which causes us to expedite, and now the schedule is out of date.

## 8. Our data is not readily available nor accurate nor communicated

It is difficult to predict the load on our facility relative to our capacity - our reports and existing software don't help or they are more trouble than they are worth. Our estimates for set-up and job run times are not accurate. This combined with all the items above make it difficult to provide due dates that we can hit 99+% of the time.

And because so many things can go wrong at any time, and we don't have good feedback data or communication within the shop -- we can't predict. We can't predict when we are going to complete a job, if we're going to be late, so we end up breaking set-ups and expediting when we really need to.

And if we try to improve our due-date performance (DDP) by extending lead-times, we start to lose work to the competition. And if we miss too many due-dates or by too much, we are in danger of losing the client anyway.

So we do what we can. We use the reports we have which are based on less than perfect data. We create a detailed shop schedule, and then we update it, and update it, and update it ...

#### 9. Communication between silos is difficult

When something goes wrong within our company or with one of our vendors we don't always know right way. Real-time feedback is non-existent. And customers don't always get back to us in a timely fashion.

We don't always communicate with our sales people and they don't

always communicate with operations/scheduling. There is usually just a lot of finger pointing back and forth. And a number of people want the ability to change shop priorities.

It's not that we don't want to communicate, it's just that everyone is so busy dealing with all of the stuff above, there's no time to do yet one more thing. And, who needs the conflict that is likely to occur?

We don't have a quick snapshot of what we should be focusing on at any particular time. We don't know what's in jeopardy of being late, and it's tough to get a sense of how we're doing.

> What's YOUR biggest scheduling challenge? One of these or something else? www.VelocitySchedulingSystem.com/ebook/survey

## The Schedule is DOA ...

So now we know why our schedule is Dead On Arrival. Actually when you list out all these challenges it's really amazing that we do as well as we do.

So it's no wonder it's so hard for you to maximize your productivity, achieve 99+% on-time performance and reduce lead-times.

But nevertheless, we do try to improve. The problem is that we focus on improving one or a couple of the above challenges and we diminish them some -- but we don't have any *substantial* impact on our on-time delivery performance or reducing our lead-times.

### What if we had a Paradise Plant?

If we have correctly identified all the major causes for the difficulty in managing production, then it means that if we could address each one that the shop would be relatively easy to manage. The schedule would

not change, we would not need to expedite, and we could be on-time, all the time.

#### Do you agree that, if:

- 1.clients never change their mind,
- 2.and vendors always supply whatever we ask for, on time,
- 3.and our mix stayed constant and our constraint did not move,
- 4. and people are excellently trained and disciplined,
- 5.and all processes are reliable,
- 6.and machines never break down,
- 7.and quality is superb,
- 8. and data is readily available, accurate, and communicated,
- 9.and communication is good,

#### Then:

Managing production would be a piece of cake?

This seems logical. So I tried it. Now, I could not find a real Paradise Plant, but I did find a simulated one. And I gave the simulator to some very good schedulers. The simulator didn't think for them, it didn't make any decisions, it only executed the decisions they made.

The simulator presents a relatively simple operation -- considerably fewer resources and products than what you have to manage in your real operation. And there is NO variability or skill issues. All of the challenges listed above are gone.

We went over how the simulator works - how to order material, how to set up a machine, what the orders are, the exact routing for each product, exactly how long each process is, etc.

The simulator could be frozen and the participants had as much time as they wanted to carefully plan and execute. They also did a short trial to make sure that they weren't hindered by the software. This should be a piece of cake, *right*?

## What Happened in Paradise?

We asked each participate how they did and what their results were. NONE of the participants shipped all their orders -- meaning they were NOT 100% on-time. And it wasn't because of lack of capacity.

In addition, they reported that their well planned, detailed schedule was only good for about the first 2 days. After that they were running by the seat of their pants making a lot of course corrections.

How can it be that when all the challenges are removed, we are still left with the same 3 undesirable effects /problems?

- 1. Not all customers' orders are shipped on time.
- 2. Original plans have a very limited life or are dead on arrival.
- 3. There are a lot of course corrections and expediting.

This means that the list of challenges we collected are not THE major cause of the above three items because they occurred even after we removed these challenges. So it must be that we have not yet identified the true cause for these negative effects.

## So, That Didn't Work!

A better ERP, customers who don't change their mind, higher skilled labor, a constant constraint, a constant mix, and so on wouldn't completely solve the 3 problems.

But working on one or a few of these challenges is typically what we do. We hire a Lean consultant to help reduce our set-ups or to better organize our work space -- and we do reduce our set-up time and we are better organized, but did we substantially improve our DDP, reduce the number of times we need to break setups or reduce our

lead-times? The answer is typically no, not substantially.

Are you tired of spending money on consultants, programs, and software that don't substantially improve what matters? I know I was.

But what are our choices? Lean is the most popular and Theory of Constraint is gaining in popularity. So let's take a look at the traditional improvement programs, after all, this is what everyone else is doing ...

# Traditional "improvement programs" DON'T Work for Custom Job Shops

According to Taiichi Ohno (inventor of the Toyota Production System from which Lean is based<sup>2</sup>), for Lean to improve throughput and ontime delivery, the processes, products, and demand must be stable for a "considerable length of time".

And while this is true in the car industry – who has relatively stable demand and who only allow model changes once a year -- and usually the vast majority of components are unchanged, this is not the case in custom job shops and machine shops, making "off the shelf" Lean a challenge.



Okay, what about Theory of Constraints (TOC)? Custom job shops and machine shop have constraints, but they move depending on the mix of work. Leveraging a moving target is difficult, making "off the shelf" TOC a challenge.



This is discouraging. No wonder shops spend time and money on programs that deliver little bottom-line results.

The Toyota Production System became known worldwide first under the name Just-In-Time (JIT) and later as Lean production. Toyota itself claims that Lean production does not fully capture its TPS spirit due to distortions in communications and implementations.

## The Solution is Born

After becoming a consultant (and before I owned a shop or knew anything about job shops), I offered my first client to work for free and only to get paid if/when results occurred.

My first client was a machine shop.

I just left a regular pay check at Anheuser-Busch where they pay you no matter what you do, did or accomplished. And now, I only get paid if I deliver results, and I just unknowingly picked the toughest case possible. Yikes!

I had to find the solution if I wanted to get paid.

It took a while. It wasn't easy. The client was understanding and great. The answer was a combination of Lean and Theory of Constraints *customized* for job shops.

"Off the shelf" Lean and TOC didn't work, but some of the concepts from both were critical to the success of the ultimate solution.

## **But, Does it Work? YES!**

Those same schedulers (who did the Paradise Plant simulation) were taught this new system. And this time they completed all the orders on time. And after that, they went back to their real life plants and applied what they learned to their much more complex environment.

Their results? Substantially better due date performance, substantially reduced

"We transformed our historical 60%, on time record to 100% on time, in about six weeks. We have now been 100% on time for the last four weeks. We found hidden production capacity and also increased our profitability"

Richard Pettibone

lead-times with much less chaos.

## The Solution explained in 47 minutes

I have taken the entire solution called the Velocity Scheduling System and boiled it down to a 47 minute webinar.

In that time you get an overview of the entire solution and you know exactly what to do tomorrow to start on the path to reducing the time it takes a job to get through your shop and to getting on-time.

How can it be done so fast? I get to the point and explain exactly what most job shops are doing wrong and why. You'll be shocked to learn that common practices are part of the problem – and you will need to stop focusing on certain things.

I don't try to sell you anything. It's pure content. I WANT you to take action tomorrow and know how, why and what specifically to do.

#### The Evil Scheme Revealed

What's the catch?

The simple answer is so I can hopefully sell you something later on. (Shockingly honest, I know. *Uncommon.* But in the consulting business, there's no room for anything else.)

Look. I believe that if you put the free strategies I give you to work in your shop, you'll improve your performance, increase customer satisfaction and loyalty, get more clients, work less overtime and **make more money.** 

And when that happens, I'm betting you'll call me up and ask if I can

help you take it to the next level. So, if you're ready for the solution, sign up for the free webinar here:

#### www.VelocitySchedulingSystem.com/webinar

Once you're there, you'll be able to register for one of the upcoming webinars where you'll receive (for free) an overview of the entire solution to scheduling your shop that can **reduce your lead-time**, **increase your due date performance** ...with *less chaos* than ever before.

If you're struggling with scheduling your shop, don't miss this webinar. I tell you EXACTLY what you need to do tomorrow and give you an overview of the *entire* solution!

Sincerely,

"Dr Lisa" Lang, President, Science of Business

P.S. If you're ready to reduce the time it takes to get a job through your shop and to get on-time, just head over to: <a href="https://www.VelocitySchedulingSystem.com/webinar">www.VelocitySchedulingSystem.com/webinar</a> and watch now.

P.P.S. VSS is implemented during a 14week on-line coaching program. I personally work with you to customize everything for your shop. So it's inexpensive, no travel fees and there's no need to have a consultant camped out in your conference room!



## P.P.S. Would it be worth 47 minutes of your time if you got results like these?



"You have heard of the Horse Whisperer well Dr Lisa is the **Job Shop Whisperer**.

She has taught us to read the messages that our job shop has been communicating to us all

along. Signs that our instincts and training have caused us to ignore.

Many of the things this program asks us to try are counter intuitive, but I would encourage everyone to have faith and try them because the downside risk to trying them is almost nothing.

The program is well thought out. It is structured in such a way that each week you gain insights from observing what is actually happening in your shop. This weekly epiphany is great because your team becomes motivated, inspired and committed to making more changes.

It sounds too good to be true, but it works. **Our due date performance is currently tracking at 100%**, 3 months into the program. Our lead times are being maintained at market expectation and we are charging a premium for times that clients want things faster. Our job shop is calm and ordered with almost no visible work in process and our scheduler has cancelled his prescription for angina tablets.

The best part about the system is how easy it is to run and manage. Our team is able to get immediate feedback when things go wrong from simple measurements. The corrective actions required are obvious and have an immediate impact which helps develop peoples understanding. We are much more focused on doing the things that matter and stopping doing the things that don't."

Daniel Heerding

**We saw results almost immediately!** The first thing was the dramatic reduction in chaos. We used to spend every week chasing jobs that were lost or behind. Now we can see exactly where they are and when we expect them to finish. We also experienced a significant increase in the amount of work we complete on a weekly basis, **nearly doubling our throughput**. Thank you, Dr. Lisa!

Bob - Michigan

Exceeded expectations!! Admittedly, I was a skeptic. How could a manual program help a company schedule and execute hundreds of work tickets at a time? Certainly, such a program would be overwhelmed! The only thing overwhelmed is how pleased I am with results of the Velocity Scheduling System! Does this sound familiar? We would flood our plant floor with urgent work tickets. Tickets would get started and then sit around for, maybe, weeks. Parts were made would get lost . . . thrown out? Completed part counts were wrong. Work tickets marked as complete . . . weren't. And, the list of woes could go on. Each and every one of these phenomena were quickly solved with the Velocity Scheduling **System.** We now have complete control over our plant. Our work tickets are able to be tracked and product can be easily located in the plant. We know when a work ticket is done and the quality with which each ticket is completed is better than in our company's history! Work tickets are completed faster and with more accuracy than ever could have been imagined. The plant loves working with the Velocity Scheduling System and strives to get work tickets completed on time and with great quality. It has brought us together as a team! It took Dr. Lisa to bring to the plant floor with great clarity what Eli Goldratt was really trying to get us to understand in "The Goal". Great job, Dr. Lisa!! We are completely thrilled with our results!!

Gary Arkin

"Lead-time through the shop reduced 50-75%!" Read full story here.

Paul Steck

"We would certainly recommend the VSS Program. It is a useful tool for implementing order in a chaotic job-shop. The best thing about the VSS Program is that it's PRACTICAL. One doesn't just get taught a lot of theory. Right from the onset, trainees are given practical tasks to implement in their job shop. Before starting the VSS Program our factory operated without a proper job flow. There was no clear order to how jobs were prioritized when they entered the factory – nor on their lead times.

With the implementation of VSS, we now have a clear **VISUAL SYSTEM** on what jobs are currently being worked on, which department they are in and how long the job has been in the "system". We also have the tools to better plan job priority orders.

Additionally, we are also now able to gather and analyze data concerning our factory, better."

Adar Segev

The VSS Coaching Program has provided a level of transparency for all the steps/activities involved in our shop. With this, we have **increased are on-time performance by 20%** while **increasing our throughput by more than 34%** (actual jobs completed on the floor). This system has also improved accountability, communication, are forecasting for all of our work. We also have benefited from the metric and planning tools to better track and manage our workload.

Brian Bunch

"From when our company started tracking each facilities on time performance, we have led with an average of 98%. So I was skeptical that VSS was going to make much of a difference for us. I was (very) wrong with my vision of the limited possibilities. This program has transformed our production from a "Pushing" to a "Pulling" flow through our shop. We have changed from a shop, with individual departments and brought us together as a Team. The communication across the floor, the focus on work and where attention is needed, problem solving, quality and Volume have all improved. And all of it has come with a whole lot less stress. We have been researching and trying other ideas and programs, each with some level of success but Dr. Lisa's program and personal support has given us the results that we have been looking for. Thank You Dr. Lisa."

James G. McClelland, Robinson Fans

"We have seen a much improved process flow through the shop. Scheduling has been simplified and easier to manage. Our overall throughput has increased."

Myron Baker, Robinson Fans

"We are a small manufacturing company with +/- 20 employees. We thought we had a system that worked until our sales increased dramatically and we experienced difficulty getting the jobs completed and shipped. We just couldn't get the work out fast enough to make a profit. Although we have some fine tuning to do with our Velocity System, **shipping has increased**, we are able to see and address our issues right away, and everyone in every department seems to like the visual system. This visual system helps us maintain consistent and reliable communication regarding our jobs by showing where they are at any time in the process. The added bonus is our entire team working together on the same goal and that is priceless."

Kathy Opatik

"Prior to the start of the program, there seemed to be constant stress in trying to balance the work load and meet delivery times. Now, after completion of the program, we are nearly caught up with all work that was behind schedule and much better positioned to meet an increase in demand through an increase in available capacity. Our operations are very complex and the work we are required to perform can very greatly, however, we are able to attain our objectives without much of the "panic" or chaos that was present before. We have a solid base established that we can continue to improve and perfect as we grow our business! Thanks Dr. Lisa!"

Shane Pence, Manufacturing Manager

"We increased our velocity of jobs getting though our shop. it has helped point out many flaws in our shop that where previously getting hidden or overlooked to help increase productivity."

Marcus Ellis

"We finished off our fiscal year end 10/31..... could have never turned things around w/out the VSS.!!!!!! We finished the year in the black because 'the board' helped us focus on FINISHING! The last 6 months also saw a **serious improvement in on time delivery**, and an **increase in the volume of orders** thru our building... No job gets lost in the shuffle no matter how longs its in the building... THANK YOU!"

Tanya DiSalvo

"Dr. Lisa, Thanks to your program Velocity Scheduling System Gulf has **improved Delivery times, reduced rework, improved team work, improved cash flow**, and it has really impressed our customers with such a planning system they can actually follow the progress of their job as it progresses threw the shop. The reduction in chaos has to be one of the best benefits to the program. No more putting out fires all the time. The proper planning and scheduling has really improved this aspect of our operation. This would be great for any shop to consider.......as long as it's not my competition! Thanks again and we are looking forward to the Mafia Offer Program next Month."

Vint Massimini Gulf Engineering Co. President

"After trying different solutions, included expansive scheduling software with years of implementation required, we finally found a system which delivers what promised! We reduced dramatically (about 30%) our already good manufacturing lead times, have a stable and reliable schedule and everybody in

the plant knows what to work on at any point in time. There are so many great things about the VSS but the key is that it's really fun and easy to implement because it engages the organization as a whole. Thanks Dr. Lisa!"

Alessandro Bernacchia Manufacturing Manager

"Since the introduction of Velocity Scheduling System, we've seen an average of 5 jobs ship per week, which was about 1 every two weeks prior to the VSS Coaching (that's **10 X more job done**). Our backlog has gone from an average of 55 jobs to around 20 (while sales remained constant). We've also reached 100% on-time performance for all new jobs booked since the VSS Coaching began. Another benefit realized is a steadier invoicing outflow and cash inflow."

Rick Lightcap

"Overtime has been reduced by 75% while increasing OTD to 95% through this period..."

Steve Fleissner

"We decreased the time it takes to get a job to get thru the shop. Using the visual scheduling board gives all the employees a chance to see what is going on."

John Popescu

"This is the best system for manufacturing that I've encountered... Trust me I have seen and implemented many JIT, Lean Six Sigma systems in the past and this is the best.... Dr. Lisa, the creator and facilitator of the program, is top notch."

Luis Fernandez, Schlumberger

"The Velocity Scheduling System has become the centerpiece of our tool shop. The simplicity of administration and visual nature of the system has been received well by the shop. **Jobs are finishing faster and deliveries are improving** thanks to the VSS Coaching Program."

Eric

"Shipping more, less chaos and better cash flow!" Read full story here.

Danny Elsas

"Before starting the Velocity Scheduling System our on time delivery was about 68%. After implementation of the system we're currently running at **100% OTD**. The velocity board has been a great tool that provides visibility not only to myself but everyone in the shop. Daily 5 minute meetings keep everyone informed of how jobs are running and if there any problems. This system has been a great help and we are very happy with the results."

Richard Pothier

"After completion of the course our **on-time delivery has improved from 68% to 95%**. Using the VSS principals our goal is 100% by year end!"

Tim Merrifield

"Dr. Lisa has provided us with a flexible shop "Operating System" that has provided many benefits to both our engineering and production departments. **Chaos is down; visibility and speed through the shop are up**. This allows management to make clearer decisions for both product planning and overall corporate strategy. I would definitely recommend the Velocity Scheduling System to other shops that know that they should be doing better. Dr. Lisa has the experience to show you how."

Clinton

"Identifying bottlenecks and decreasing work in process definitely helped **improve throughput**."

Kirk

"Increase Productivity, Flow AND Delivering Faster than Anyone Expected!" <- click to read full story

**David Meares** 

"I have seen a **serious improvement in the past two months for on Time Delivery, and less chaos thru out the Shop**. We have cut our "Work In Process" by 40% as far as I can tell and no Job is getting lost in the shuffle no matter how long it's on the floor. So as you can see we have a way to go, but I know we are on the right track."

Ralph

"We increased our speed dramatically. Thanks to VSS we sell 80% more than before – within two month! Due date performance grew from about 60% to nearly 100%."

Nils Peters, ALTONA S.A.

That's just a sample, you'll find over 100 <u>testimonials</u>, <u>reviews and case studies</u> on the website!

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