



One Thousand Conversations with CEOs in Manufacturing

The Five Challenges Revealed

On Time | Edge™

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Customer Demand is Unpredictable

What does unpredictable demand look like in the real world of manufacturing? Extremely difficult. Especially in today's markets buffeted by multiple crises.

Every manufacturer's goal is to manage schedules and production flow to deliver on time without creating excess inventory and incurring significant unplanned overtime and expediting expenses. It's tough to do in even the best of times. We'll discuss approaches that can help improve operational efficiency.

Let's start with demand forecasts.

What's the Best Way to Deal With Forecast Accuracy?

Customer intimacy. Let us explain. Manufacturing companies, especially complex, vertically integrated ones, must develop intimate relationships with their customers. Which ones? Focus first on your most important customers with whom you spend most of your time, about whom you worry the most. (We're putting aside the lumpy or intermittent forecasts, or worse, lumpy customer orders, where demand is erratic and unpredictable.)

“*... customer-intimate companies stress ... a willingness to take on responsibility for achieving results. They will often put themselves at risk to further their clients' success. They will even take responsibility for an operation and deliver a guaranteed result.*”

The Discipline of Market Leaders, M. Treacy and F. Wierseman

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Customer Intimacy at Walmart: Vendor Managed Inventory (VMI)

The ideal form of customer intimacy is when customers share actual end-customer use of their inventory. For example, Walmart does that today with its vendors and has been doing it for decades. Their objective is to make sure that the shelves always stay full. They share their inventory at the point of consumption, at the point of use. Every store has its inventory, and that inventory level is shared with all its suppliers.

Suppliers can decide when to replenish inventory, not at the warehouse level, but when to replenish a store (or stores) if it is running low on stock. Suppliers get full visibility and track and measure stockouts in stores. That's VMI. Using it, Walmart has removed links in the supply chain, removing the warehouse, HQ interactions, and communication failures from the product flow as much as possible.

The benefits of VMI: Everyone has full visibility, inventory is tracked and measured in near real-time, so stockouts at the store level are reduced or eliminated. This model helps Walmart minimize operating costs and offer low selling prices at retail.

Does the VMI Model Work in Manufacturing?

You bet. That same concept can and should be applied to complex manufacturing. For example, instead of ordering a hundred components every two months (i.e., demand), the real consumption of those hundred items may be five or 10 per day over a given period of time.

4 Steps to Real Synchronous Flow

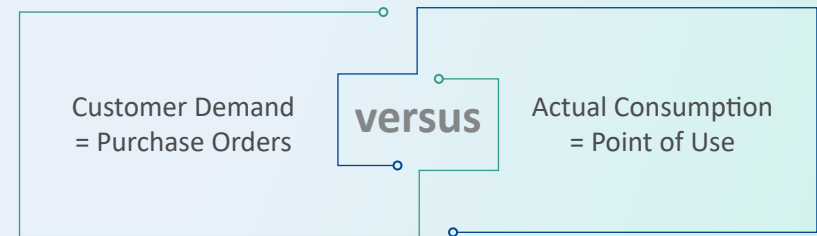
1. Change your planning and scheduling mindset — lead with language (words matter!) — that informs your sales, production managers, customer service, and planners and schedulers that a production strategy based on consumption and not demand improves the performance of your clients, their end users, and your own company.
2. Deepen your relationship with your customer by making the business case for consumption-based planning and scheduling and its benefits, among which are:
 - Preventing excess inventory
 - Reducing stock-outs
 - Lessening process cycle times
 - Managing variability for more stability and control
 - Improving profits
3. CEOs or owners must train their sales and customer service reps (and other client-facing people), to develop this intimate relationship as a trusted advisor with your customers so you can synchronize your production to their true consumption. Customer success is your success.
4. Make sure that customers are fully satisfied with your performance. But, remember the goal is to do away with the artificial, lumpy, traditional way of fulfilling demand as a manufacturing supplier.

Gain an Extra Edge When You Need It Most

Let's talk about ...

- How you can transition your customers over to a vendor-managed inventory process
- The latest techniques for planning and scheduling production in your plant or multi-plants
- A Quick-Start implementation approach to enable a more stable, proactive, and productive planning/scheduling process as soon as possible

Synchronize Your Production to Actual Product Consumption



Similar to Walmart, your objective is to synchronize your production with a customer's true consumption, not the demand they're giving you. That's a significant change in how most companies do business or think.

Vendor-Managed Inventory (VMI) to the Rescue ... but It's Not Enough

In a previous post, we discussed vendor-managed inventory. We explained how Walmart teams up with suppliers or vendors to manage their inventories at the store level across enormous volumes and a mind-boggling number of SKUs (stock-keeping units). VMI is built on a vendor having visibility into inventory, releasing products as needed, and matching the velocity of inventory movement to the point-of-sale or end-use consumption. Planned volumes are released in an uninterrupted, smooth flow.

To replicate this flow in manufacturing takes a little more work. When customers give you an open or blanket PO (Purchase Order) at the beginning of the year, they expect always to have all of the components they're ordering from you. Therefore, you manage stock levels in your customer's raw materials inventory. At this stage, you're just trying to replenish and ensure they never run out of stock. That's one level, but you're two levels removed from your customer's own demand. You may be getting visibility into what they're consuming from you but not necessarily seeing what they're selling to their customers, which then triggers a consumption of their raw materials. If they get lumpy demand or decide to produce large lot sizes, you're still not getting accurate visibility into how they're filling the demand for their own customers.

A Note About Blanket or Open POS

A blanket or open PO can satisfy customer demand for the whole year and they get discounted pricing based on a large volume. (There's usually some provision for incremental shipping costs.) Customers do not desire all that quantity at once, however. Out of a large blanket PO for, say, one thousand parts (we often see it as a PO in the system that is open for December), customers send you what they call a release for 50 or 20 at a time.

Consider the model below, which, if achieved, builds a very intimate relationship with your customers.

As a manufacturer, you can supply to customer demand. It may sound shocking, but that's the worst situation to be in. A better approach is to institute VMI, where you're always responsible for enough stock or a certain level of stock for your customer. The ultimate level you want is to gain visibility on your customer's demand. If you know when your customer is selling parts, you can replenish the raw material they have yet to consume. That's a smooth, anticipatory, intimate, and highly profitable relationship for all parties concerned.

Customer Intimacy: The Right Inventory Released When Needed

Here's a basic inventory and ordering question:

How do you, a manufacturer, not satisfy the need a customer is communicating to you via electronic data interchange (EDI) orders— which is lumpy demand— but fulfill their real needs relative to their customers' use? (Lumpy or intermittent forecasts, or worse, lumpy customer orders, are the ones where demand is erratic and unpredictable.)

Measurable Added Value, Not Just Hype

You save your customers time and expense by determining what and when they should order from you. You can determine needed quantities far better than any of their people with the right software and thoughtware tools. This kind of efficiency is a huge value add because purchasing departments spend a lot of time with their customers figuring out when they should give you a PO, place an order, or place a release against an open PO or a blanket PO.

However customers order now, begin to nudge them along the path to VMI with visibility into a customer's own demand and be way ahead of the curve. Sadly, only a few manufacturers we run into are doing that. On Time Edge knows how to do that. We do it, and we do it very well. And that is very attractive for our clients and their customers.

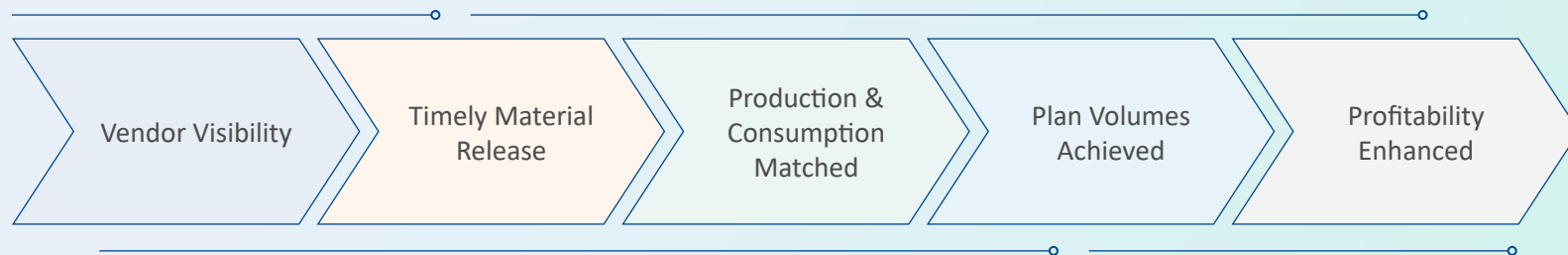
Start Getting Ahead of the Curve

Let's talk about ...

- How you can transition your customers over to a vendor-managed inventory process
- The latest techniques for planning and scheduling production in your plant or multiplants
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Smooth Flow Model

Based on Vendor-Customer Intimacy



It is Difficult to Find and Retain Qualified Labor

On Time Edge wishes it could wave a magic wand and offer an easy path for manufacturers of all sizes to find and keep qualified workers. We recognize that this talent problem is a particularly tough challenge for small and mid-sized manufacturing firms. Human resource disciplines are outside our core expertise, but we can outline some criteria and observations that may provide helpful guidance to define and recognize highly qualified labor. Like any resource, the lack of good people in your company and in the marketplace can seriously constrain growth.

This discussion focuses on direct labor, that is, those employees whose work can be allocated to certain products or services (production). In contrast, indirect labor is employee work that can't be traced back or billed to services or goods produced (overhead).

Measuring Sticks for Qualified Labor

In a previous post, we discussed vendor-managed inventory. Let's start with some measuring sticks for direct labor in manufacturing because, without clear criteria, you will struggle to keep or find the best-qualified people.

Experience has taught us and our clients that the men and women who are measurably the smartest and most conscientious are most likely to develop successful careers and make many contributions to the company in the long term.

Okay, these two attributes (smart and conscientious) are obvious, and a bit apple pie. But look deeper: these "economic contributors," as we call them (a la mode, if you will), make the right things happen in the right order and in the right way. They demonstrate:

- A track record of verifiable results accomplished at your company or at prior companies
- An ability to build or integrate into productive teams
- The skill to maximize the efficiency of the key people under them or with whom they interact
- Most importantly, an understanding of the bigger picture by executing the strategic business priorities of the company

These are the qualities that you should be looking for, evaluating, and rewarding. Evaluate your people or the people you are screening as career candidates who have these qualities, can speak ably about them, and can prove them with examples from their work.

Sadly, these "economic contributors" began to slip away when through no fault of their own, manufacturing jobs started shifting to low-labor-cost countries during the '80s and '90s. The pendulum has begun to swing back after 10 to 15 years of good and bad experiences with manufacturing in other countries. (Due to the pandemic slowdown, the present recession may dent these re-shoring efforts for some companies or increase domestic production for others.)

Every manufacturer can tell a firsthand horror story about a long-distance quality production problem and the pain of setting things right. Companies are realizing that manufacturing done domestically or at least on the North American continent will reduce:

- The incidence of production snags and the recovery time due to them
- The long lead-lag times (by eliminating weeks to months in shipping delays)
- The barriers (language and others) to resolving quality issues

What Can Help?

Of course, hiring qualified labor domestically is a key determinant of success as a manufacturing company. These “economic contributors” are a precious resource and are a constraint when you don’t have enough of them in your shop. This situation is textbook Theory of Constraints (TOC) where you have to exploit your most critical resources — or constraint — better than your competition. So, whether it’s in a job shop (e.g., specialized welding, or high-skilled assembly labor (e.g., electronic components), the trick is to create a plan or a schedule that maximizes the efficiency of these constrained resources. Identify the key resources in the facility around them so you can manage capacity based on the toughest labor skills to acquire.

Who to Focus On

One of the most underrated and essential labor skills in the org chart is the planning and shop floor execution department. Shop floor supervisors, operations managers, production managers, directors of operations, and COOs, of course, are going to have the most significant impact on the bottom line of a company. That’s where the company’s smartest and most conscientious people should be.

How to Retain the Stars You Are Able to Hire

Arm Your “Economic Contributors” With the Best Tools

Provide your best performers with the right technology and an outside partner that will keep them up with the latest technology — whether it’s an advanced planning and scheduling system (APS) or a manufacturing execution system (MES) — to help them do their jobs effectively at peak efficiency. Easy-to-use systems and believable, irrefutable data on which to base decisions increase their job satisfaction which helps you retain them. Otherwise, the attitude of “Why can’t we get anything done around here—or do things right?” erodes job satisfaction.

Further up the org chart, the C-suite needs quality data from these systems to make data driven decisions to run and grow the business. If the data quantity is there, that information becomes an accurate depiction of reality and a guidepost for directing the company.

Data quality should be viewed at the same level as parts or production quality. Data quality should be a control function. It should be tracked, measured, audited, and remedied. The lack of data or reliance on poor data should be considered as serious as a part or machine breakdown. If the data is adequately maintained, you can rely on the system and the validity and reliability of the data upon which you base your operational and strategic decisions.

Digital Transformation in Manufacturing is Here

Speaking frankly — the commitment to systems and data quality isn’t a mentality we see in many medium-sized manufacturing companies. If you are the CEO of a medium-sized manufacturing company, you need to think hard about systems, software, and data quality. Companies that are charging ahead now are embracing technology advancements that are both mainstream and out on the edges: AI, IoT (Internet of Things), Machine Learning, Big Data, eCommerce, and more.

Note this. Within the next 48 months, more than 42 billion IoT devices will connect people and organizations across industries, channels, and value chains (Source: IDC Market Intelligence). The impact on business strategy and execution is both real and immediate.

Organizations and Their People Have Consistently Struggled to Understand and Adopt Technology

Hence, it is difficult to use it as a competitive weapon to gain market share.

Allow us to start with a personal business story. We've hired a digital marketing and communications agency, which brings our company expertise and skills that we could not develop on our own. Even more, the multiple digital and creative skills necessary to do what the agency's team of specialists do would be difficult, if not impossible, for us to replicate. Worse, if we tried to do digital marketing effectively ourselves, the task would distract us from our strategic priority of producing more efficient operational and financial performance for our customers. Of course, we do use advanced technology in our work with customers — that's the technology we know and which can add economic value to our customers.

Workflow Pain Points or Burning Platforms: Is This Your Company?

- Scheduling is done via Excel
- Procurement is handled via ERP (with a transactional focus)
- Scheduling and Procurement do not seamlessly communicate
- Neither do Sales and Production
- Customer Service doesn't have timely information
- Quoted delivery dates are sometimes (or often?) a guess
- Always fighting fires when disruptions occur
- Expediting and overtime costs eat up profits
- Margins are not nearly close enough to industry averages
- The old guard is retiring, and systems and technology are not in place to fill the experience gap



Hire Experts Who Can Optimize Manufacturing Flow

Get smart people who know the technology to help — that’s a model we want you to consider when you look at your complex manufacturing or multi-project environment. Here’s why: the technology and software related to the spectrum of production data is moving faster than any single person can learn and execute. What data are we talking about — data related to:

- Project Engineering
- Project Management
- Product Development
- Planning the Work
- Scheduling the Work
- Executing the Work on the Shop Floor

What are the end results sought from these data:

- More Throughput
- Better Asset Utilization
- Reduced Inventory and OpEx
- Reduced Cycle-time
- Higher Margins
- Near-perfect On-Time Delivery

Buy or Build? Buy!

The attitude we see among some manufacturers, especially small and mid-sized companies is: “We’re doing something wrong, or we wouldn’t need those consultants. We can do everything on our own. We just have to find the right people.”

That’s no longer true. Period.

For the sake of argument, let’s play out an unlikely scenario. If you are extremely lucky, you may have or find that rare individual who is IT knowledgeable, a planner, and a scheduler, or a person close to the shop who can work magic and pull the information that the shop floor needs from, let’s say your ERP system. No matter how smart the person is, you must groom this individual and wait for the learning curve to peak. This is a short-term solution because such a high-value employee might head out the door at any time seeking the next opportunity. Or, they may be out sick on a day when all hell is breaking loose on a custom order.

The best step owners and leading executives can take from a hiring standpoint is to find (internally or externally) and retain personable, smart, and conscientious people who will identify long-term consulting partnerships that offer the best technology and thoughtware.

The smartest mid-sized manufacturing companies understand that the world is moving too quickly for them to develop planning software and “thoughtware” specialists inside their company. (A lot of larger companies understand this constraint or fact, and that’s why the Gartners, McKinseys, and others exist. When evaluating specialists, look for those with expertise in demand management and execution, including planning and scheduling for complex manufacturing companies.

Do Not Fear the Dreaded “C” Word: Consultants

If you don’t consider hiring a consultant, you risk another “C” word, you’ve created a constraint which can work against your success and profitability.

Hire manufacturing planning and technology experts who offer methods, concepts, tools, and integration services that will help you achieve the results listed above. It’s rare in small to medium-sized manufacturing companies to find an individual or a group who knows as much as our company does collectively in this market—a straightforward pitch on our part. We believe this assertion is true, not only for planning and scheduling functions but also for technology and software related to networking, connectivity, and security.

We urge you to find a partner that offers the broadest knowledge and who stays up on current and future trends and have proven they can bring opportunities to take advantage of technology and enable you to leap ahead of your competition.

ERP is Not Enough

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Our ERP system cost us a bunch in dollars and time invested, yet still, we struggle to meet timelines and deadlines.

That’s a complaint (or some variation) that we hear a lot from COOs, CIOs, and other operational and financial executives.

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ERP systems offer many benefits, but they do not offer the information needed to plan and schedule workflow. It doesn’t provide visibility into production variables, nor can it project “what if...?” scenarios that are useful immediately or projected into the future, nor does it offer the impact analysis of changes due to variability.

Comparison of ERP Systems and Advanced Planning & Scheduling (APS)

Capability	ERP	APS
Past Performance Reporting	✓	
Material Requirements Planning (MRP)	✓	✓
Available-To-Promise (ATP)	✓	✓
What-if Scenario		✓
Optimized Schedule Generation		✓
Capable-To-Promise (CTP)		✓

What are you missing without an APS in place?

New Products Take Too Much Time to Develop

Great ideas flounder while market opportunity slips away.

Multiple projects. Multiple players. Delays.

Here's the challenge many complex manufacturers face: minimize product development time from start to finish in multiple project environments.

Let's paint a picture of this challenge — likely it exists in your company: you've launched a new product development project, and it will involve many people internally: sales, engineering, purchasing, operations, the CEO, the CFO, nearly everyone in the company. In addition, it will engage external vendors for sure, maybe an external design firm, a marketing firm, and a consultant or two. Now, let's say that multiple projects are in the hopper, demanding numerous resources, some (or all) of which will be used on other projects at the same time.

Let's throw another variable into the mix of projects and players, and that is TIME — time from start to finish. Every industry faces one or more of these ticking-clock scenarios: new products needed due to macro market demand or opportunity, category seasonality, customer special requests, required feature upgrades to remain competitive, or the development of next year's models (e.g., the auto industry).

Of course, industries that rely heavily on new product introductions due to short product lifecycles must constantly develop the next model or add innovation. In these cases, time is of the essence. You either enter the market early — or late, missing the revenue opportunity that goes to competitors who move faster.

How to Manage it All? Critical Chain Project Management Software

On Time Edge believes that projects can be completed more quickly and with greater scheduling clarity by using the Critical Chain Method, as opposed to the Critical Path Method of project management. These two methods are often confused but shouldn't be. Critical Chain focuses on resources, while Critical Path focuses on task order. The benefit of Critical Chain is that you get real-time control of all your projects, sorted by priority. Additionally, you can run what-if scenarios to check an impact analysis (of your possible changes based on variables, i.e., real-world barrels under your feet).

Epicflow, our provider of choice, fulfills all the requirements we suggested earlier. In addition, Epicflow integrates easily with Microsoft Project, Jira, Oracle Primavera, HRM Systems, and custom integrations as required.

Does Epicflow Stretch?

Absolutely. Projects are Projects. No matter where they are found.

AI-Powered Resource Management

Use Epicflow's mobile app to access and update the information whenever it is convenient. Epicflow integrates with Jira, MS Project, Oracle Primavera, or any other tool of your choice to enable faster and cheaper delivery of multiple projects simultaneously.

- Manage multiple projects with shared resources
- Use predictive analytics to make weighed decisions
- Deliver more projects on time

The Industry Doesn't Matter. We Can Help.

Companies (not necessarily manufacturing) that support their product development and allied engineering efforts can benefit from this Epicflow. This software is easily applicable to software development projects.

How about farther? On Time Edge has worked with a roofing client. They have a crew that goes out and installs roofs day after day. They understood the need to keep key installers hammering down roofing tiles. Even more, management understood that managing multiple projects using key resources simultaneously has to be carefully planned. And that project management software, such as Epicflow, was necessary and indispensable.

What is Critical Chain Project Management?

Critical Chain Project Management (CCPM) is a project planning and management method that emphasizes the resources (people, equipment, physical space) required to execute project tasks. Eliyahu Goldratt developed CCPM in his 1977 book Critical Chain. It differs from traditional methods, such as Critical Path Management (CPM) and PERT, which emphasize task order and rigid scheduling. A Critical Chain project network strives to keep resources leveled, requiring them to be flexible in start times.

CCPM can complete projects at a rate of 10% to 50% faster and/or cheaper than the traditional methods. If resources are always available in unlimited quantities — not the typical state of affairs — then a project's Critical Chain is identical to the Critical Path.



The Lead Time for Critical Capital Equipment Takes Too Long

Future production requirements aren't "visible" soon enough in the business planning cycle.

Company owners and senior executives face a significant strategic worry: the increasing unpredictability of future market needs and stability. That concern causes deep uncertainty when facing large capital investments in heavy equipment.

Ordering complex equipment, which involves long lead times, has become a riskier financial and time-consuming proposition given the current market disruption and recovery. The more complex the machine, the more cash is involved, no matter the purchase terms. Such a big decision entails a serious price tag in dollars and time. Ordering a new machine can sometimes stretch to 12 or even 18 months. Who knows what the future holds in 12 to 18 months, when (or if) the machine finally arrives?

Let's say a discrete manufacturer is considering the purchase of CNC machining equipment, a boring machine, a lathe, or a multi-axis machine that performs multiple operations on a single workpiece.

They might need a consultant who can leverage vast experience in heavy industrial, complex, and deep bill of materials manufacturers who fabricate and machine their metal pieces. They should also look for consultants with expertise guiding complex manufacturers and mid-sized companies who must deliver a product on time without excessive overhead and contingency costs.

Finally, the consultant should demonstrate the ability to help you think creatively to avoid pulling the trigger on ordering expensive equipment, especially before it is needed.

Hope is Not a Strategy. Promises Are Not Execution.

Hope is not a strategy, nor are promises made under duress. First, take a cold-light-of-dawn look at demonstrated capacity, not theoretical, not promises, and certainly not promises from well-intended employees making claims without all of the facts. It's all too human to over-promise and under-deliver.

Drop-dead critical variables must be defined when deciding whether to purchase additional equipment, and you will need to use realistic delivery times and capacity metrics. Be sure to use the demonstrated capacity to calculate your load versus capacity, as opposed to a theoretical or non-demonstrated capacity. For example, if you develop a range of different products, it's particularly difficult to estimate the duration or the consumption of capacity for each critical piece of equipment for all those products.

Get the visibility of the hard facts to make well-founded decisions. You need to record and carefully review the demonstrated time of consumption relative to your capacity. You have to be realistic with your expectations and what you can produce. This rigorous analysis is a critical component of being a reliable company that delivers on time.

What is the real goal?

Nobody here even asked anything that basic.

Creative Ways to Increase Capacity Before You Sign a Purchase Agreement

Given the risks involved, here are some creative ways to increase capacity and to eliminate the bottlenecks in your production process. Consider these flexible alternate solutions, if you haven't already:

- Maximizing the shifts during which current equipment is used
- Minimizing setup, which leads to workflow optimization
- Cross-training employees on specialized equipment to man a second shift or a third shift
- Exploiting advanced planning scheduling tools that On Time Edge promotes and implements

A great vision with poor execution is a hallucination.

The Outsourcing Option, but Be Warned

Outsourcing without tight management of priorities for the subcontractors is a proposition with risks all its own. If you go with an outsourcing solution, instead of ordering the large complex equipment yourself, you need to manage your subcontractors or sub-vendors extremely tightly. No matter how good their intentions are, the burden will be on you to give them an exact schedule to follow. You must negotiate with them a certain number of hours dedicated to your products — measured, monitored, and modified only with mutual agreement. Don't throw the assignment over the fence and expect them to deliver on time. A new level of management of your subcontractors is required, which would include, sorry to say, micromanaging them and their priorities as if they were inside your four walls. Remember, you have promised your customers you would fulfill a delivery date.

Bottlenecks govern both throughput and inventory.

A Creative Cost-Saving Case in Point

A recent large customer, not a traditional manufacturer, judged that in order to keep up with demand, they must buy a new unit sortation machine to the tune of about \$1.5 million. (Unit sortation devices are huge carousels attached to chutes — 100 or more in this case — to load retail products onto assigned pallets to be shipped to specific stores.)

By performing preventive maintenance and optimizing the sequence of products running through the unit sortation equipment, we freed up 20% of the capacity on each of the four-unit sortation machines. The happy result: no need to buy a 5th machine and significant dollars saved, not to mention a better ongoing bottom line.

ABOUT ON TIME EDGE

Accelerate digital transformation with On Time Edge for an agile, accurate supply chain and manufacturing operations excellence. We deploy and integrate supply chain solutions and smart manufacturing systems, so they work the way they're supposed to and your company gets the ROI you expect.