



# If Only We Had All the Parts

By Dave Garwood

"We have most of the parts for all of the products. But we don't have all of them for any of them," grumbled a frustrated assembly manager. It's impossible to be productive when you don't have the material you need to get the job done. Part shortages have been a frustrating thorn-in-the-side of everyone on the plant floor for a long time.

These front page headlines appeared in two major newspapers:

**"Mack Trucks expects 4th Quarter losses due to parts shortages."**

Wall St. Journal, December, 1987

A decade later this headline appeared:

**"Boeing delays assembly of jetliners. Lack of parts blamed."**

Atlanta Journal, September, 1997

Isolated occurrences? I don't think so! From 1987 to 1997 the problem continued to plague industry. And it still does. In spite of three recent decades of highly-touted management concepts from ERP to Total Quality Management to Lean Manufacturing, part shortages continue to be a major nemesis for manufacturing companies in the new millennium. I still hear about it all the time in my travels to companies. But there is good news! Some companies have been able to cure this dreaded disease. The "cure" is proven and abolishes the shortage problem 100% of the time!

## **Shortages Make the Bottom Line See Red**

The part shortage problem takes a huge toll on cash flow, the income statement and the balance sheet. Production is frequently interrupted. Operators and assemblers are forced to stop and start production while waiting for missing parts. This drives costs up – a lot. Ever try to fix the lawn mower or solve a home computer glitch and have constant interruptions? Frustrating, isn't it? Did it take longer than expected?

Inventory goes up as parts we have sit in the plant or warehouse (and on the balance sheet) waiting for the few parts we don't have. Shipments are late. Revenue recognition to the income statement is delayed. Balance sheet transfers from inventory to accounts receivable are also delayed. Some customers refuse to wait for late, long deliveries. They cancel the order. All of the parts we did have for that customer become excess and maybe even obsolete – negatively impacting both the balance sheet and income statement.

Part shortages cause a huge amount of hidden costs. Unfortunately, in many companies, the impact of chronic shortages on financial performance isn't recognized and is often underestimated. We load up the organization chart with hired guns to saddle up and



chase the part shortages. Sometimes we call these people "coordinators." Other times they are called "expeditors." Some are called managers and VP's. Salaries for these bounty hunters, airfreight and overtime are just a few of the expenses that are buried in overhead (or burden) and G&A. I could go on and on. I think you get the picture. Part shortages cost a bundle. Are these value-added activities? Of course not. So why do we continue to tolerate the problem when it can be eliminated?

Everybody deals with part shortages sooner or later! It is just a matter of how much they are willing to spend on dealing with the problem. Two alternatives to dealing with the problem are:

**Alternative A:**

Push, React and Solve. Some companies try to "muscle" the part shortage problem with high performance (and very costly) expediting efforts. This is an after-the-fact firefighting approach. They discover part shortages on the plant floor when they run out and then scramble (aka expedite) to get the missing parts. Some companies stage parts prior to the planned start of the assemble operation, make a list of the missing parts (aka Hot List) and expeditors chase down the missing parts. Some companies have operated this way for so long, they convince themselves that this practice is "normal." The best expeditors are even revered and rewarded, reinforcing the behavior! As one production manager told me with tongue in cheek, "expediting is our core competency." In effect, customer service and quarterly financial revenue performance has been delegated by default to expeditors and "tribal knowledge." That's scary!

Some companies spent mega-bucks on ERP software, Yet as I walk around the company, I see Excel spreadsheets everywhere. This is the "real" system that is used to run the business and get product out the door. Makes you wonder why they invested in the new ERP package! The ingenuity put into creating "workaround" expediting systems is unbelievable. The shop floor has several handwritten lists with HOT marked all over them. These informal systems are a key part - and substantial cost - of the infamous profit-draining "hidden factory."

The expediting approach is not only expensive, it is also risky because the expeditors often don't have enough time to react and get the missing parts when needed. The result is late shipments to the customers.

Ever try to define expediting? Here are a couple of definitions. Which one is correct?

1. Moving the schedule date (or kanban signal) up to be received earlier, i.e. compressing the lead time?

or

2. Overriding the schedules (or Kanban signal) to make sure the right parts are being worked on?

After asking this question of thousands of manufacturing folks, the overwhelming reply is answer #2. Why do they find it necessary to override the schedules – the schedules



coming from the new seven-figure software package? The answer is simple. The schedules are rarely met. And why? Most shop floor people and suppliers don't believe the schedules and don't take them seriously. And for good reason! The formal schedules are rarely valid. The date due does not match the date needed. How do they know? Here is one clue – a lot of work, including purchase orders and supplier schedules, go late and no one says a word. Kanban signals pile up and no one gets excited. Expediting is an effort to search for the truth. The plant floor and suppliers are forced to work to another schedule, aka hot list, to get the parts they need to make shipments.

#### **Alternative B:**

Plan, Execute, Avoid ... and Reap the Benefits. This is a preventive approach. The shortages are discovered before they occur. This alternative shifts the efforts from putting out fires to fire prevention. This proven approach is less costly than alternative A and is guaranteed to eliminate part shortages.

Alternative B is based on getting clear visibility of the correct future requirements and communicating to the internal and external suppliers what is really needed before they run out. The suppliers get adequate time to cost-effectively get the parts that are needed. Six Sigma execution of the schedule by the suppliers avoids the shortages. The approach is not glamorous or complex. And it works every time. The right parts are delivered at the right time with no excess inventory or cost premiums. Success with this approach depends on a few fundamental factors.

#### **What Goes Wrong?**

There are many potential failure nodes to getting valid schedules – all solvable. For example, build schedules (master schedules) become overstated, usually front-end loaded. Inventory records are incorrect. Bills of material are inaccurate and not properly structured. Bill of material changes are not effectively managed. Configurations for sales orders are slow to get into the system. And then they are wrong when they finally do get into the system to drive component demand.

Some companies decided to try to buy their way around the failure nodes. They purchased new ERP software. They fantasized that the failure nodes could be magically overcome with new software. Software often helps, but when business processes such as demand planning or bill of material structuring are broken, the process fixes require a change in approach and attitude. New software rarely impacts these root causes of broken processes.

#### **Can They "Pull" Their Way Out of the Problem?**

Proponents of pull systems using kanban signals would claim the answer is yes. In fact, the manufacturing world has become saturated with naysayers who claim the number of failure nodes with alternative B is the reason to avoid this approach. Really? What is the alternative? Kanban is often their answer. They are right, but only in a very few limited cases.

Kanban is a very effective tool, but it only works under a stringent set of conditions. For a detailed explanation, read "The Message in the Milk Bottle" in our online library. Kanban only works when the obstacles are overcome to satisfy these stringent conditions. The ideal solution is to overcome the obstacles and use Kanban on all parts. We just don't live in an



ideal world! While a growing number of companies use a collaborative Kanban approach to manage some short lead time purchase parts, the majority do not. Kanban is used to manage less than 20% of the parts in even the best companies "doing" lean manufacturing. The parts that qualify for kanban are often low-value parts and WIP subassemblies. Of course, there are exceptions, but not many. So how do they manage the rest of the parts?

They use the future build schedule (master schedule) and the bill of material to calculate future requirements. The future build schedule may be based on firm customer order demand, sales forecast or a combination of both. These requirements are netted against inventory. Production is scheduled or planned to satisfy the net need. These future needs are communicated to the internal or external suppliers in a variety of ways and by a variety of names. Does this sound like an old idea? It is and it works 100% of the time to eliminate shortages, when done correctly.

Some call this approach MRP or MRP II. Some say it is part of ERP. Whatever you call it, it works for those parts that don't qualify to be managed using kanban. What is the alternative to kanban and MRP/ERP? I know of none, except reacting to physical shortages and expediting. We know the results of that alternative. They aren't pretty.

Beware of a few misguided critics who paint an incorrect picture of MRP/ERP, often for self-serving reasons. In his book, "Lean Six Sigma," Michael George makes a significant point. "A few Lean and Six Sigma advocates have gone as far as to suggest scrapping MRP. On the other hand, companies are faced with the problems of scheduling thousands of parts per day and are at a loss to know how to operate without their MRP/ERP systems."

Jim Goffee, Vice President of Manufacturing at Zebra Technologies reinforces Mr. George's point. "Material delivery and material planning are two different tasks. Kanban is a material delivery system. MRP is a material planning system. We use both to our advantage."

Anyone who is promoting the idea that you must scrap MRP/ERP to do Lean manufacturing is not serving industry well. Magazine articles and books are filled with misleading myths about MRP/ERP. My position is not to defend or promote MRP/ERP or Lean manufacturing. A high-performance business needs both. The next Hot List will deal with these myths in more detail and explain how to use both to achieve high-performance business goals.

#### **A Guaranteed Approach to Wipe Out Part Shortages**

Avoiding shortages is simple in concept. It requires dedication and discipline to these basic factors:

1. Get clear and valid visibility of future requirements. How do you know what parts are needed and when you need them if you don't know which parts and how many are going to be used in the future? And when you are going to use them? You don't. If future requirements are totally based on history, they will almost always be off track. This is true if using kanban or MRP/ERP. Future requirements and kanban sizes must be based on what the market (customers) will need and what the company is able to supply. It also has to be in sync with the financial expectations. Sometimes (or better said ... all the time)



compromises between what we can sell, what we can make and the resulting financial implications are essential. An effective SOP process is the proven tool to integrate the plans and find the compromise. Be sure to view the first video in our Tii Network Technologies series for a real-world testimonial from a CEO who has experienced it!

This does NOT mean the sales forecast must be accurate, i.e. no variation between forecast and actual sales. We do need to simultaneously work to minimize variation and to be flexible with the supply plans. This is true for both MRP/ERP and Lean/kanban!

2. Maintain data at Six Sigma quality levels. We must know what it takes to make the product, i.e. accurate and properly-structured bills of material. We must have accurate data on what we already have in inventory. Structured bills and inventory records are the output of business processes. High quality means meeting the expectations of the customers. The expectations are easy to determine for inventory records. The expectations of the internal bill of material customers requires more thought. In both cases, the proven steps to raise quality to Six Sigma are well known. Use them and the inventory records and bill of material quality will be at Six Sigma.

A few skeptics will raise doubts that the bills and inventory records can approach the level of accuracy (or quality) needed. They probably had the same skepticism about zero defects for parts. Last time I checked, many companies proved that skepticism to be unfounded. If it takes longer than 90-180 days to solve the data quality problem, you are doing something wrong.

3. Measure key factors. "You can't manage what you can't measure," says Meg Whitman, the very successful CEO of eBay, in a recent Fortune Magazine article. There are a few key metrics to focus on to avoid part shortages. Download and print our 24-page booklet in pdf format, Supply Chain Best Practices and Performance Standards for tips on benchmarking your supply/demand process.

An equally-important aspect of measurements is to use them constructively. Measurements should not be used to find the guilty party and punish them. Measurements should be used to help focus efforts to fix broken processes. For a detailed discussion on measurements, read "Caution: Measurements and Accountability May Be Hazardous to your Health" in our online library.

4. Unwavering dedication to execution. At the end of the day, the suppliers, both internal and external, must deliver the parts 100% on time, with zero defects. Interestingly enough, parts delivery performance is often a measurement that does not exist in many companies. I often ask, "What percentage of the supplier parts were delivered on time last week?" The data does not exist. Therefore, accountability to deliver what is needed and when they are needed is nonexistent. Ask for the parts delivery performance in your company and see what you get.

#### **Stop Living with Part Shortages and Have Less Inventory and Lower Costs**

Sound like a contradiction? Historically, conventional wisdom was to increase inventory to reduce shortages. My experience is the opposite. When inventory surprisingly goes up, it is almost always a clear sign that the supply chain processes are broken. We are simply getting too much of the wrong stuff and not enough of the right stuff. Fix the broken processes and watch those shortages vanish. Then watch as cash increases and costs drop!



It's time to get out of denial. Part shortages are not inevitable. Having all the right parts should be the targeted end state – the vision. The factors identified above are the key elements to meeting that vision. Old tools such as high-powered expediting may be exciting and fun for a few, but you won't get there with expediting. Focus on reaching Six Sigma performance for the processes that manage the four factors discussed above. Turn part shortages into a bad dream of the past.

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