
SPEED TO MARKET

*A Newsletter for
Job Shops–Niche Manufacturers–Focused Distribution Systems*

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Feature Article

Contract Manufacturing A Variation on a Job Shop Theme



It is not uncommon for job shops to seek relief from the feast or famine nature of order driven businesses, either by developing and marketing a proprietary product, or entering into a contract manufacturing relationship with a customer who provides a continual source of work. Although contract manufacturing can be a stabilizing force in an order-driven world, it comes with it's own set of requirements and management challenges.

In a contract manufacturing relationship, a shop is generally awarded a blanket order for some number of items to be produced and delivered over a defined period of time. For example, a customer may issue a purchase order to buy 600 items over 3 years, but the timing and quantities released are not specified or necessarily predictable. The shop invoices the customer for the quantity released when it is produced and shipped.

To complicate matters further, the customer usually expects almost immediate delivery on releases against this blanket order. This means the shop has to anticipate demand and build ahead to some finished goods inventory position. In effect, the only thing that separates contract manufacturing from a mass market, build-to-stock business is that sales are guaranteed by a purchase order, so the shop is not subject to the vagaries of the market, which can leave you with unsold units and obsolete inventory.

The fact that releases against the order are most often erratic in terms of timing and quantities, and the customer wants virtually immediate delivery, forces the job shop into operating a build-to-inventory manufacturing model (often in addition to the job shop model which coexists at the same time). This build-to-inventory, or build-to-stock system as it is sometimes called, more closely resembles mass production than it does a job shop where items are typically shipped as soon as they are produced, and no finished goods inventories are held. Shops that are not familiar with, or have no expertise in, build-to-inventory production will likely find themselves confused and unprofitable.

Note: When you negotiation this type of contract, make sure the time frame is clearly specified and as short as possible. Also, get a preliminary forecast from the customer, and make sure that all parts must be shipped and invoiced by the end of the contract period.

Volume Pricing without Volume Production: Another complication that arises is volume pricing without volume production. In other words, the total blanket order may be for 600 pieces which is quoted, but actual production over the order period may be several releases of varying quantities. Unless the shop decides to produce all 600 items at once and carry them in inventory, the cost of production must be increased to cover the cost of additional set ups and the inefficiencies of short runs, as well as the cost to carry the inventory built, but not shipped, for each production run. The customer, of course, pays the 600-unit price even though the shop may actually produce ten 60-piece orders.

The same is true for raw materials. Unless a shop is prepared to purchase, finance, and inventory the raw material requirements for the order, raw material pricing will have to reflect lesser amounts purchased over the cost of the contract. You will pay more for ten 1000-pound orders than you will for one 10,000-pound order.

For an individual shop, the complexity of a contract manufacturing relationship can become magnified when it is supplying more than one item. Scheduling and inventory management can become a nightmare without adequate systems, knowledge, and skills.

So how do you manage this type of demand and still make a buck?

Change Your Thinking: We have already mentioned the need to change one's thinking from a job shop system to a mass production system with demand forecasts, inventory management, and generally longer runs. It's a different production system that needs to be understood, designed, and managed differently.

Charge Enough: This seems obvious, but unless you understand how contract manufacturing differs from typical job shop production, you will underestimate what it actually costs to service the contract. One way to get a handle on what it will cost is to imagine you will produce all 600 units at the same time, inventory them, and fill orders from inventory as the customer requests them. Figure the cost of production plus the cost to carry one half the inventory (average) for 36 months. A good rule of thumb for the cost to carry inventory, which includes the costs of storage, financing, insurance, taxes, handling and the possibility of loss or damage, is in the neighborhood of 20%. This means it will cost you \$20,000 for every \$100,000 of inventory you have stocked. Hard to believe, but there are lots of hidden costs involved. (Reducing the cost to carry finished goods inventories while servicing just-in-time demand is one of the reasons lean manufacturing has become so popular.)

Forecast as Accurately as Possible: But in reality you will not build all 600 units at once and inventory them...this is just a device for getting an approximation of the costs involved. More likely, you will produce some number of runs with sufficient inventory to meet demand until the next run. This means you also have to determine stocking levels, safety stock, reorder points, and run quantities. How many items do you make and when do you make them is a critical question, especially when there are penalties for stock outs (for example, if you fail to deliver on time you may lose the customer). On the other hand, you may have capacity constraints that prevent you from building the ideal amount every time.

Multiple runs over the life of the order means multiple set-ups and their associated costs, plus the cost to carry the average inventory between runs. Note that the first set-up is generally more costly than subsequent set-ups because CNC machine programming, fixturing, tooling requirements, and inspection routines have already been worked out and only have to be repeated, not created.

Partial Builds: You might also consider taking a page from textile manufacturing and the concept of “gris (French for grey) goods.” Gris or uncolored fabric is woven and kept in interim inventory. When orders are received, the quantity is pulled and dyed to order. This maintains the greatest flexibility in inventory which is especially necessary in the fashion industry where colors change frequently, and obsolete inventory is a very real and costly problem. You don’t want to get stuck with 100,000 yards of blue velvet when everybody wants lime green. In other words, you may not have to build the entire item all at once. You may produce components, for example, and assemble them when orders are received. It depends on what you are producing and how long it takes to finish partially produced orders, but the concept of gris goods may be of some value to you in reducing inventory and managing capacity constraints.

As more companies seek to reduce inventory with just-in-time manufacturing systems, there is a tendency to push inventory back in the supply chain. This hides the inventory but does not eliminate it. If it takes time to make a product and a customer wants it right away, then it has to be built ahead of time, in whole or in part, and this means inventory. So don’t be misled by the propaganda of kan-ban techniques and lean systems that promise zero inventories. There are times when inventory is necessary and the best you can do is minimize it.

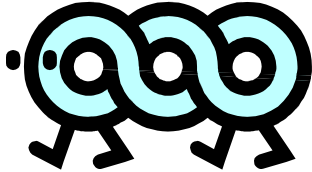
Migrating to Custom Manufacturing: If you are making a transition from a typical job shop to a contract manufacturing system, here are some things to keep in mind:

- **Build Your Infrastructure:** Recognize that a contract manufacturing relationship is a different business from a job shop, and one that requires infrastructure development. You may need to provide additional education and training for your employees, install new or upgraded computer systems, adopt different scheduling methods, develop inventory storage and tracking systems, establish greater working capital reserves with your bank, and more. Readers of *Speed to Market* will recognize the organization problem of having more than one business under the same roof. Clearly differentiating and managing multiple value streams, as well as restructuring your organization appropriately are very likely to be required.
- **Don’t bite off more than you can chew.** Start with one or two items if you can, and then work up to multiple items. If you are in a situation which has become out of control, consider giving up some of the parts to save the whole.
- **Work closely and communicate often with your customer.** In effect, you have become an integral part of their organization...adaptability and reliability are key to your ongoing value to that customer. Also, don’t underestimate the difficulty of servicing demand...you may have the work because the customer learned they couldn’t do it themselves.
- **Be prepared.** It’s best to conduct a comprehensive organization assessment to determine what you need to change or upgrade before you find yourself in the middle of a situation you cannot manage... and find is costing you more than it’s making

Contract manufacturing with its steady source of work and stability is appealing to job shops that seek relief from the ups and downs of an order-driven business. But it’s not all peaches and cream...contract manufacturing brings its own set of difficulties and management challenges that can be particularly difficult to conquer. As the old saying goes, be careful what you wish for because you might get it.

Closing the Loop

The Importance of Comparing Plan to Actual Results



Readers of *Speed to Market* are familiar with the concept of “closing the loop.” That is, comparing plan to actual results on an order-by-order basis. The following situation illustrates why this simple step is so important.

A business owner we know recently discovered a situation that has everyone reeling. It seems he was touring the floor, talking to employees, and generally asking how things were going. One operator said he was making plenty of money for the company because he was running three jobs at once on three different machines. He then proceeded to tell the owner that he was logged onto all three jobs, and that's when the bells and sirens went off.

Their computer system they are using is not set up to allow an operator to charge time to more than one job at a time. Initially, they set the system up to use "ghost" operators to capture time spent by an operator in multiple work centers. But it seems that one of the supervisors, without understanding how the system worked, instructed all the operators to log onto any multiple jobs they were running. He assumed the operator's time would be charged to each job.

Instead, what the system did was divide the operator's time (7 hours total) evenly over the three jobs he was running. So instead of a job being charged 7 hours (the actual machine time), it was only charged 2.3 hours. Fourteen hours of work were "lost."

This, of course, has a devastating effect on time and materials jobs which are grossly undercharged as a result, as well as corrupting the information used for quoting repeat work in the future because the actual amount of time required is understated. With a number of operators working multiple work centers every day, you can see how quickly this adds up to a great deal of lost revenue very quickly.

There is a good chance that closing the loop and seeing jobs completed with hours significantly under estimate would have alerted management to a problem and discovering this situation sooner.

How does your computer system handle operators running multiple jobs? If you don't know, it sounds like a good idea to find out to make sure something like this is not happening to you.

November 9th...
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Presented by Vincent Bozzone, President, Delta Dynamics Incorporated

PACIFIC ELECTRIC DISTRIBUTION COMPANY AN ORGANIZATION DESIGN CASE EXAMPLE

Introduction: Pacific Electrical Distribution Company (PEDCO) distributes electric supplies and related items through 135 branch outlets located throughout the western United States. Typically these include wire, fuse boxes, switches, lighting fixtures, tools and other items used by electrical contractors and maintenance personnel.

Presenting Problem: PEDCO was purchased from its corporate parent by management and financed via a leveraged buy out. Cash flow and earnings were erratic and this led to difficulties regarding timely payment of principal and interest on the loan. This naturally was unsettling to the bank and a remedy was mandated.

Initially management believed they could stabilize earnings and cash flow by imposing a standardized set of operating policies and systems on each branch. They believed that exerting more control at the branch level to ensure operational consistency would result in more predictable financial results.

A pilot program involving 10 branches was initiated. The approach involved:

1. Determining the “best practices” for managing a branch; and
2. Installing the systems and management reporting that would make branch operations (and presumably financial performance) more uniform.

Failed Solution: Not only did standardization fail to solve the problem of erratic financial performance, this strategy had a decidedly negative effect on sales and earnings in some previously high-performing branches in the pilot group. At this point PEDCO’s management decided to seek outside assistance to help them solve this problem.

What We Learned: One of the first things we learned was that PEDCO actually served three different markets (types of customers):

- Residential electric contractors (generally small companies and one-person shops)
- Commercial electrical contractors (generally larger firms involved in commercial and institutional construction projects)
- Institutional maintenance (maintenance for hospitals, factories, schools, and similar facilities)

We learned that each customer type had very different product needs and service requirements. For example, extending credit to small residential contractors was the most important factor in gaining a larger share of this market. Credit terms had virtually no impact on institutional sales where inventory variety and availability were paramount. In effect, PEDCO operated three different businesses when viewed from this perspective.

We also learned that these three sources of demand were erratic. For example, a large commercial project may turn a nearby branch into a “star.” However, when the project is completed, the star’s fortunes may fall very rapidly. The same is true for residential construction which is not stable inasmuch as new housing starts are highly dependent upon interest rates and real estate prices. Branches with a high percentage of institutional sales were the most stable.

We learned that not all branches served all three markets. Some branches had no commercial construction business. Some branches enjoyed a large and growing institutional business while others had virtually none. Some branches were very active in residential construction while others were not.

We learned that consistently better performing branches adapted operations to suit their customer mix. Branch managers of these better performing branches employed different credit policies, modified inventory levels and mix, altered delivery routes and schedules, and generally found ways to serve their customers more effectively based on their particular set of needs. Often, branch managers had to find creative ways to offset corporate policies and directives that hindered their ability to tailor services to their customer base.

Once we understood these characteristics, it became clear why standardization failed. In fact, just the opposite—flexibility was required. Standardization made it more difficult for branch managers to tailor services to suit their particular customer mix, and this made individual branches less valuable suppliers to these customers.

An Effective Solution: The solution that ultimately had the greatest impact on results was both operational and organizational. Operationally, the “best practices” approach was modified to reflect the three market segments. “Best practices” for residential construction are not necessarily “best practices” for commercial construction or institutional maintenance. Branch managers were encouraged to learn as much as possible about their customer mix and trends in their local market, and then to use the best ideas and practices from other branches to serve their customers better.

Management’s Mission and Job Defined: Organizationally, the solution involved the introduction of a new paradigm. Our recommendation to management was this: “Look at your organization in the context of its geographic scope. Recognize that your mission is to provide the best possible distribution coverage throughout this region with the resources you have at your disposal.” In effect, the western region was PEDCO’s “customer.”

- Senior management is responsible for recognizing changing needs for service throughout its operating area and reconfiguring the distribution system accordingly. This means changing the number and location of branch outlets quickly and efficiently as necessary. When an area “heats up” as the result of construction activity for example, management decides whether or not to set up a branch to serve that local market. When activity subsides in an area, management decides whether to aggressively pursue new business, downsize, or close the branch.
- Look to the future and monitor construction activity and trends. Develop an intelligence system (i.e., issuance of building permits, newspaper articles, and other information) so that you know where the action will be before your competitors move in.
- Use objective criteria (sales, earnings, inventory turns, return on investment, etc.) to evaluate branch managers’ performance, not compliance to a rigid system.
- Senior management’s job is not to “oversee” branch managers; rather it is to manage the overall configuration and optimization of the branch system by adding, moving, resizing, and closing branches as demand dictates. PEDCO was not in the real estate business as some executives believed.

- The branch manager's job is to understand the local customer base and deliver value-adding services accordingly.

Lessons Learned:

- Standardization is not always an effective means for increasing management control.
- The presenting problem may not be the real problem. Although the basic problem in this case appeared to be erratic cash flow and earnings at the branch level, the "real" problem was PEDCO's inability to meet the loan repayment schedule and the resulting breach of loan covenants. Once it was recognized that branch performance was inherently unstable, the solution strategy was reframed to focus on improving the performance and consistency of the total distribution system-- a macro as opposed to a micro approach.
- A pilot program can be useful for testing hypotheses and avoiding big mistakes.
- Take the time to learn and understand the specific characteristics of a business.
- Think dynamically, not statically. Don't be afraid to rethink the prevailing business theory or paradigm. "What business are you really in?" and "How does your company add value?" are useful questions and tools.
- Don't let bricks and mortar "concretize" your thinking.
- If you are a consultant or operating from a consulting model, recognize that your position as a consultant enables you to look at the organization "from the outside in." This perspective can be very valuable for executives and managers who see their organization from the "inside out" and are generally bogged down in a morass of detail that defeats perspective. Use your "position perspective" to advantage and help management see the business in a new light when required.
- Clarify the organization's mission, business strategy, roles and responsibilities.

Note: Although no appreciable change was made to PEDCO's structure, this example can be seen as organization design work by virtue of the reframed perspective, conceptual changes, role clarifications, and new strategies introduced. PEDCO also illustrates how important it is to include the business concept (paradigm, theory) in design thinking.

Could This Be You?

I am really glad to see that Delta Dynamics is moving forward. I feel very strongly that many companies can really benefit from your expertise and guidance. I did push one of my clients to get in touch with you. They had many problems. Unfortunately they tried to fix the problems themselves and closed their doors !!

M. Nawar, Former Chief Engineer, Robert Mitchell Company

Don't let pride or prejudice stand in the way...call us today to learn how Delta Dynamics can help your business grow and prosper in today's increasingly demanding and competitive business world. Phone 248-333-0482 or ddilink@aol.com
