

**MANUFACTURING INSIGHTS® presents:**

Supply Chain

Collaboration

A Lean Supply Chain @ John Deere  
Version 1.3

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**MUSIC UP AND UNDER**

**NARRATION (VO) :**

Manufacturing Insights, Manufacturing Engineering magazine's video series for  
process improvement.

**NARRATION (VO) :**

This program is about the successful partnership between John Deere in Horicon,  
Wisconsin and one of its suppliers, the R&B Machining and Grinding Company  
located in Racine, Wisconsin. Over the last few years John Deere has started  
many supplier development projects with the goal of becoming a more competitive  
company.

Fade to black

**NARRATION (VO) :**

Most suppliers like the R&B, face tough times as larger Original Equipment  
Manufacturers demand price cuts while simultaneously tightening quality and  
delivery requirements.

**NARRATION (VO) :**

But one of R&B's customers is John Deere, who has built a reputation for helping it's suppliers meet the challenges of becoming a world class manufacturing company, instead of only forcing demands on them.

**NARRATION (VO) :**

Although these two companies have been doing business for many years, things changed when Deere made a strategic decision in 1988 to outsource all machining operations. This change resulted in a great opportunity for job shops like R&B and the small family run company prospered.

Paul D. Ericksen on camera : 08.01.34 It used to be that companies like John Deere were vertically integrated. And that means that the processes, the manufacturing processes, that were strategic to our product, were pretty much done in house, in departments, in our factories. \* Over the last generation, a lot of these processes have now been outsourced. Basically what that means is that we're buying strategic parts, strategic processes, from suppliers. \* The question we have had to ask ourselves at John Deere is, have our supply management strategies changed in recognition of this basic change. The answer that we have is that for our strategic suppliers, we feel that we need to treat them more like a department within our factory than some outside entity.

**NARRATION (VO) :**

Through the next few years of growth, R&B continued to operate as a job shop and the perception of the company was that they were flexible, but not as efficient as possible.

**NARRATION (VO) :**

And since the competition to John Deere's products come from all over the world, every company in the Deere supply chain needs to improve to be able to compete with any company, any where in the world.

**NARRATION (VO) :**

So, several years ago, Deere representatives met with Ray Biddle Sr., and the rest of the management team at R&B Machining & Grinding, and asked them to participate in a supplier development program. As part of this program, Deere

was willing to send in people who had experience in cellular manufacturing, but R&B was not quite ready to roll out the red carpet.

RAY Biddle, Sr. on-camera 01.17.17 The biggest part was when they contacted us, I did a lot of soul-searching. In our business you get an order, you make parts, you ship them. This was something where they were asking us if they could come in and look at our production standard, so they knew exactly how much money we made and how much we didn't. We thought about it, and we thought it has to be a win-win situation for both of us, and it's worked out pretty well. 01.17.48

**NARRATION (VO) :**

WITH A TENTATIVE GO-AHEAD OF R&B MANAGEMENT, JOHN DEERE KNEW IF THEY STARTED SMALL AND HAD IMMEDIATE SUCCESSES, R&B WOULD BE WILLING TO LOOK FOR EVEN MORE IMPROVEMENTS. SO THE FIRST TARGET SELECTED WAS THE WASTEFUL PRACTICE OF MOVING PARTS BETWEEN DEPARTMENTS.

RAY on CAM 01.16.09 Where before they went from one department to another, we have some parts that went to three departments, today they run on a cell. One fellow takes care of all the operations, and it gives him a certain amount of pride. At the end of the day they know what they did. 01.16.30

**NARRATION (VO) :**

The employees at R&B knew cellular manufacturing was more efficient, and they needed to learn to look beyond individual machine efficiencies.

RAY on-cam. 01.17.48 The investment in cellular manufacturing is a little unique because you may have one machine that goes very, very fast and other machines that go slow. So in a cell, if one machine could make 50 pieces and another machine can make 25, your rate is 25 pieces on the cell. 01.18.06  
**edit**

01.18.19 . It took us a little bit, and we now have a lot more capital tied up in the cell, but it has more than justified itself. The profit margins on the cells are very nice, and that makes us competitive. 01.18.34

**NARRATION (VO) :**

AND BEING COMPETITIVE IS THE MAIN REASON BOTH COMPANIES WANTED TO START THIS PROJECT. TO SHOW A COMMITMENT TO THE SUPPLIER IMPROVEMENT PROJECTS, DEERE KEEPS A FULL TIME EMPLOYEE AT R&B MACHINING & GRINDING. ARIC ANDERSON, WHO'S CAREER IS IN SUPPLIER DEVELOPMENT, WORKS WITH EMPLOYEES AT ALL LEVELS INSIDE R&B.

Aric on camera : 02.04.39 We spend eight hours a day here, usually more. We hold several meetings with management, the owners, to let them know where we're at with the project. We'll meet with the detail people at the facility that need to conduct the work that we need to have in here, such as collecting information or executing some project metrics or executing some measurement system 02.05.09

**NARRATION (VO) :**

THE LAST THING JOHN DEERE WANTED TO DO WAS TO GIVE THE IMPRESSION THAT THIS ENDEAVOR WAS A SHORT TERM EFFORT.

Aric on camera : 02.10.54 The typical image of a consultant would be to come in here 2 or 3 days, measure what's going on, and not measure it too accurately either, and get your recommendation and leave and get your paycheck. That's just not what happens between the supplier and John Deere. 02.11.08

**NARRATION (VO) :**

BASED ON EXPERIENCE, JOHN DEERE KNEW THAT THERE MIGHT BE SOME START UP PROBLEMS.

Aric on camera : 02.10.08 They were very apprehensive to go ahead with our recommendations. We didn't leave after we gave our recommendations. We stuck around and helped them through all the hard times. To say that the hard times left is not true, there's still hard things out there that they still need to keep in tune, such as preventative maintenance and reducing your setups. 02.10.28

Aric on camera 02.07.05 They would run into problems, and they'd want to throw their hands up and say 'hey, this doesn't work.' Well obviously when you first do something in cellular manufacturing, it doesn't work right off the bat. You have to work on your tooling, labor, preventive maintenance, you have to work on all those things. So that was more of a coaching role once you got it implemented. 02.07.25

**NARRATION (VO) :**

WITH THE KIND OF CHANGES REQUIRED TO DO CELLULAR MANUFACTURING, YOU SHOULD HAVE A PLAN IN PLACE FOR DEALING WITH THESE CHANGES. SUSAN ROBERTS, GENERAL MANAGER OF R&B MACHINING & GRINDING WAS IN A POSITION TO HELP RE-ORGANIZE.

Susan Roberts on Camera : 01.21.31 We were very much, when we started, a traditional manufacturing operation. We had those department walls built into our environment. They were a little hard to break at first. 01.21.42 **edit**

01.21.58 We have different departments that had their own predestined space that when we came into the building they were used to "this is my area, these are my operators." It wasn't as easy as it is now with the sharing of resources, the sharing of what's available. It was a little challenging to

change at first, but when you mix it into the day-to-day environment, and they're able to see how it works to their advantage, it was very easy to incorporate after that.

**NARRATION (VO) :**

LIKE SO MANY PROJECTS, THE HARDEST PART WAS JUST TO START...

Susan Roberts on Camera : 01.24.57 To begin the entire supplier development process was difficult. That was something we had to go slowly with. That's why when we did start we wanted to make sure we had a strong success right off the bat. 01.25.08

Paul D. Ericksen: 08.09.03 Typically when we go in to work with a smaller supplier, a family-owned supplier like R&D Grinding, the engineering is the easy part. Getting into the organization, being accepted by the organization... we want to treat these suppliers like they're a department within our factory, but getting them to treat our people like employees of their organization is the biggest hurdle.

**NARRATION (VO) :**

SINCE IT IS NATURAL FOR WORKPLACES TO REJECT CHANGES, R&B FOUND IT BENEFICIAL TO DO SOME INTERNAL TRAINING.

Susan Roberts on Camera : 01.28.15 We had a tremendous amount of change over the last five years. We've been able to change our culture within the factory itself from one of just "this is the way we're doing it today, this is the way we'll do it tomorrow," to a continuous improvement culture where we were able to break those department boundaries, we were able to share resources. We've established training programs internally to help us get to where we want to be, and that's worked out very well. 01.28.41

**NARRATION (VO) :**

R&B PEOPLE ENJOY HOW DEDICATED THE JOHN DEERE STAFF ARE, TO THE BETTERMENT OF BOTH COMPANIES.

Susan Roberts on Camera : 01.26.23 They can go anywhere from Ray Sr. and senior management to the shop floor, they're very comfortable with that. They're willing to roll up their sleeves and go right into it as far as "I think it can go this way and it will work," and to demonstrate that, rather than just to say "try this." It's always been an atmosphere that's not just talk. It's very much we will be arm and arm as we try and accomplish whatever tasks we're trying to do. 01.26.48

**NARRATION (VO) :**

BUT THE TRUE TEST OF ANY IMPROVEMENT PROJECT IS SPECIFIC RESULTS. RAY BIDDLE

JR. WHO IS THE R&B PRODUCTION MANAGER, EXPLAINS CUTTING CYCLE TIMES FROM WEEKS TO HOURS.

Ray Biddle, Jr. on camera : 04.14.24 A classic example is a rib roller shaft that we made. We ran it through several operations. The first operation was the sawing, the second operation was the CNC turning, the third operation was it went to another area to get drilled and tapped, then it would go out and get plated, then it would come back and we would bore out the ID. Now, between us working with John Deere on the part, we were able to make some modifications on the part. We used to have to bore out the ID to take the plating out after the final operation, we had to remove the plating. We had to work with John Deere to eliminate that. Now by combining all the machines together we basically now have the saw together, both machine turning centers, and the machining center. It would literally take up to two or three weeks at times to get these parts through the shop. I now can bring in the steel, put it on the table, set it up—and with the setup reduction we have I was able to set it up now in 2-3 hours. In 2-3 hours I set up four machines, my saw, my turning centers and my machining center, and it would send the parts to the plater literally within 24 hours. I get them back and now that I don't have to bore them after plating, I ship them. 04.15.35

**NARRATION (VO) :**

Having a customer walking around free in your factory might be worrisome to some companies, but the long-term relationship between these two companies is built on trust.

Ray Biddle, Jr. on camera : It's kind of scary sometimes to share that information with somebody. It's like if you're doing really good on this part, "hey, they're making too much." But the nice part is they look at, hey, we're not doing good at this, and that's what we try to improve upon. That works out really well. 04.18.42

**NARRATION (VO) :**

The issue of trust is essential when any large company wants to come in and help a smaller shop. In many cases the larger company feels they have the most leverage in negotiations and sometimes they are the only one to profit from any improvements.

**NARRATION (VO) :**

To build this trust, John Deere has only placed dedicated people within R&B. These John Deere people are understanding of the courage it took to start this relationship, and they make sure they don't do anything to break the bond.

Aaron Armstrong on camera: 04.23.40+ When companies deal between one another,

for instance Deere and R&B, it's an issue of trust and understanding that John Deere is a big place. We may have people come in one week and try to negotiate better savings or something, or we may have problems with quality, or blame flying around for defective parts. But ultimately we persevered with that, we've really grown together.

**NARRATION (VO) :**

When a company like John Deere first sends people into your company, they are quick to find areas of improvement you may not have seen yourself.

Aaron Armstrong on camera: 04.26.07 When we first came here, they were a remarkably flexible company, but they weren't as efficient as we'd like to see. They could make anything. We could give them a spec for anything with really short notice, with one day notice sometimes, and they'd come through. What we tried to do is help them become more efficient while maintaining that same flexibility. 04.26.25

**NARRATION (VO) :**

Once the production of the parts are completed at R&B they are shipped to a "cross-docking" facility where they are sorted and shipped to various Deere factories. The John Deere Horicon Works factory is the final assembly plant for many different commercial and consumer lawn tractors and a major customer for R&B parts.

**NARRATION (VO) :**

Now that many of John Deere's suppliers are gaining in efficiencies, they are undertaking a new "Build to Demand" strategy to be more in tune with the fact that most people only buy lawnmowers when the grass is growing.

Paul D. Ericksen 08.15.15 We sell very few riding lawnmowers when there's snow on the ground. So what we ended up doing when we were building to level production, we were building ahead, and storing finished goods inventory at our dealers, and that was costing us a lot of money. So a fundamental change, along with going away from vertical integration, is also producing to demand. 08.15.42

**NARRATION (VO) :**

John Deere recognized that if they built to demand, their suppliers had to also.

Paul D. Ericksen 08.16.15 So a fundamental change for us, and it fits very well with the collaborative supplier development we've had the last five years, is making sure our suppliers are lean and able to, as best they can, meet our

demand, in the same way we're meeting our customers' demand, and that is building to our demand. The long and the short of it is, if you consider yourselves and your suppliers an extended enterprise, you want to be efficient throughout that extended enterprise. If there is cost in the entire supply chain, at some point you're going to have to pay for those costs. 08.16.56

**NARRATION (VO) :**

Many of the small, family-owned businesses needed support from Deere to be able to master this new build to demand strategy.

Paul D. Ericksen 08.17.30 So our supplier development function over the past couple years has been almost entirely focused on making our suppliers more lean, so that their order fulfillment process will be just as streamlined as our order fulfillment process 08.17.45

**NARRATION (VO) :**

But the Metrics John Deere uses for supplier development projects are not price reduction, it's manufacturing cycle time reduction.

Paul D. Ericksen 08.17.58 In other words, what we're interested in, is minimizing the amount of time our suppliers, from when they have all the raw materials needed to manufacture the product we're buying from them, to minimize that time between the time they have those materials and the time they can deliver the product to us. 08.18.17

**NARRATION (VO) :**

So along with the shorter cycle times needed for build to demand, they found they were able to get better quality, lower costs, and better delivery performance. When looking for further cost improvements, Deere also understands much of products costs are fixed once the product has been designed.

Paul D. Ericksen 08.26.48 - 08.27.11 WE also have programs where we will collaboratively get together and look at design. Is there a better way of meeting the functional need of this part than we're doing it today? Is there a better way we can still hit the specification, hit the functional specification, but not have to spend as much money making the part?

**NARRATION (VO) :**

In some of today's purchasing community there is pressure to get quick hit price reductions.

Paul D. Ericksen 08.24.42 What I'm looking for is sustainable price reductions, but what I get measured on is price reductions from month to month.

So what I need to do is come up with a balance on how to do that. There's always somebody willing to give you a better price. There's always somebody willing to buy your business. But when you find a company like R&D Grinding, who has the right core values, who bends over backwards to do all the things you need them to do, and we're not just talking about getting parts from them, they provide support in so many ways. What you want to do is to develop them so that they can help you meet your supply management goals without having to threaten them or coerce them or move business away from them. 08.25.26

**NARRATION (VO) :**

Much of the purchasing function at Deere is automated. Terry Townsend a supervisor of Material Acquisition at John Deere, works with a computer system that is tied into 98% of their suppliers.

**NARRATION (VO) :**

Electronic Data Interchange or EDI transactions are the standardized electronic communications sent to suppliers on a daily basis. Like many improvement projects that require changing business procedures, the EDI project roll-out went slow at first.

Terry Townsend on cam : 07.06.47 Not a lot happened initially. Not a lot of our suppliers either did or even knew what EDI was. Initially we spun our wheels for a year, basically not getting anywhere. We basically determined if we were going to go forward with this, we needed to go out and help our suppliers. So we looked at different EDI software. We even negotiated with some of the major software suppliers in the United States for pricing for our suppliers. Then we provided that to our suppliers with voluntary assistance from John Deere. When we offered that, we went extremely fast. It was night and day based on whether or not we were going to offer help to actually do it. It was new to them and new to us.

**NARRATION (VO) :**

This automated purchasing system runs every night and subtracts the number of units built from a master inventory file to come up with the quantity of parts to be purchased.

Terry Townsend on cam : 07.05.30

What the supplier gets is an electronic shipping schedule. It's an 862 EDI transaction. It tells them, they'll get one of those for every line item or container of parts that we want. On that signal is the part number, the PO, the quantity, the assembly line, and the assembly station where that part is actually put on a tractor. 07.05.54

**NARRATION (VO) :**

The supplier uses this daily information and makes sure they have created the product for pick-up on a specified pick-up date and they print labels for each container.

Terry Townsend on cam : 07.11.33

What we have, when a supplier makes a shipment to us, they send an electronic ship notice, it's an EDI 856 transaction. The contents of that transaction is all the parts, the PO's, the quantities, the kanban number, and the invoice number. When that truck pulls up to John Deere's dock, our receiving people can reference any piece of information on that paperwork. It could be any one of the part numbers, a PO, a bill of lading, it will pull the contents of that truck up to their screen. They hit enter, and they receive it. That books it to the appropriate assembly line by the kanban that's on that advance ship notice. So it automatically books inventory to each assembly line. It automatically creates a payment record for every part number on that shipment. And that payment will be distributed when the PO terms come due.

**NARRATION (VO) :**

Much of the easy work with supplier development has already been finished at John Deere and many of their suppliers. But now comes the hard part, keeping everyone focused on continuous improvement when the payback might be difficult to calculate.

**NARRATION (VO) :**

Every day consumers make the choice to buy a John Deere mower. Having the right suppliers will help lower the inventory expense of stock once held at the dealers so John Deere is able to match the fickle demand for mowers.

Aaron Armstrong on camera: 04.21.57 . Having responsive suppliers that can flexibly meet our needs without added cost or inventories, that's best for our entire supply chain. 04.22.06

**NARRATION (VO) :**

This is just one of the many different relationships between John Deere and it's suppliers. Each year, more companies are discovering the benefits of Supply Chain Collaboration as they work towards becoming a more competitive manufacturing company.

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