Manufacturing: Gaining a Competitive Advantage With Digital Manufacturing Simulation Software

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Cost simulation engineers are always looking for ways to make processes more efficient. We're constantly hunting for opportunities to increase efficiency while maintaining accurate cost analysis. But when production occurs outside of the walls of our company, we often spend days, sometimes weeks, waiting on pricing. This can cause a loss in momentum, as well as frustration in customers adhering to their own timelines.

At Soucy, a Canadian-based manufacturer of aftermarket parts for power sports equipment, this pricing challenge was compounded by the fact that our production happens in China—half the world away. We would design a product, receive internal approval, and then send the specs off to our China division. After waiting seven days, we'd finally receive the price and then have to go through the process of pricing approval. All in all, it would take us nine to ten days just to be able to quote our customers a price.

In the world of manufacturing, that's about seven days too many, and after one of our customers actually told us that our time to market was too long, we knew if we wanted to stay competitive, we needed to make a change. Plus, when we factored in our print-to-build business—where customers come to us with designs and we manufacture for them—our lengthy pricing could result in us losing business. We have a saying: First in gets the business. And with a nine-day pricing model, we were far from first.

To address these issue, we mapped out our entire development process to see which steps we could trim to increase our efficiency. We found that our time to market was averaging about 51 weeks with 5 main steps:

- Investigation
- Proof of Concept
- Development
- Validation
- Production

In our industry, where the average ownership of power sports is about three years, waiting almost an entire year for a new part is unacceptable.

After reviewing the investigation and proof-of-concept phases, we decided there were less opportunities to trim our lead-time at these stages. Creativity takes time, and limiting our engineers during these critical steps would hurt our business more than it would help. For validation and production, we had a few small projects in the works, but again, there was just not a lot of room for significant timesaving. So, we looked at development and asked: How can we make this phase more efficient?

Choosing A Partner

The first step in reducing our development and pricing cycles was to find a partner that would help us to win more business by helping us to respond faster and with more quote detail. We knew by bringing this step in-house, we could save time and increase our competitive advantage, so we started exploring all of our options. Our major must-haves were:

- CAD file capability, not just a 2-D print
- High accuracy in all process, not just plastic injection
- Well-respected by other top manufacturers

As manufacturers, we design products somewhere in the ballpark of 250 to 300 parts a year—we're no Ford or GM. But we wanted to find a software partner who, despite our size, would treat us with the same urgency as if we were one of the big guys.

After looking at almost all the digital manufacturing simulation software companies on the market, we settled on aPriori. Their ability to handle CAD files, more than 250 processes, and the fact that two of our main customers gave us glowing reviews of aPriori made the decision a rather easy one.

The aPriori Edge

Now, with aPriori, we cut the supplier from the cost equation and we can reduce our cost visibility lead time to 2.5 days. With that huge time savings, we now have the possibility to get to market quicker. We want our customers to know that when they are in a time crunch, they can call us and get a price quote faster than any of our competitors.

We can also use this extra time to go back and review their designs to see if we can reduce costs even further. By giving those recommendations to our customers, we're able to pass the savings along and become a trusted partner in their success. And if we are costing out our own design, since we know we can have a price in two days or less, we can use that additional time to push our creativity even further.

Plus, with aPriori, we know we are giving our customers the most accurate price available and that our process efficiency is nearly perfect. As it stands, **our average accuracy of difference between price quoted and actual supplier price is +/- 3 percent!** In a market where one dollar can mean the difference between getting a project or losing it, that accuracy is invaluable.

Beyond Cost: The Momentum of Process Efficiency

With aPriori we make better use of our resources by shortening our time to market and reducing the time in which we can provide our customers an RFQ answer. In real numbers, with the application of aPriori, we went from eight in-house hours per quote to one hour, freeing up seven hours of our time per quote. That means aPriori can save Soucy up to 3150 hours this year alone.

As for our in-house designs, this time savings allows us to push innovation even further. Before, innovation was constrained by the time crunch associated with getting a price quote from China. Now that we know we can turn around the price quote in less than one-third of the time, we are able to further focus on creativity—the crucial element of design and innovation.

With these results, it's no wonder that word of aPriori's capabilities spread quickly throughout Soucy. After hearing about the power sports division's success, Soucy's tractor division began utilizing aPriori cost analysis software six months ago.

In the past, it took as long as three weeks to get a price for a part in the tractor division, because when you're talking about 500kg casting versus mechanical assembly, if the calculation is even a little off, it can mean a big difference. Using aPriori, our tractor division's turnaround cost analysis is even less than Soucy's power sports division; we can turn around our cost simulation in just half a day!

Our experience with aPriori has been transformative. It has done so much more than just reduced our pricing process; we now have the time and space to innovate—for ourselves and our customers—and it has done wonders for our relationship with our Chinese producers. They no longer receive three to four requests for quotes per project, which reduces their own costs and minimizes the risk of mistakes. And most important, it really helps create a "cost culture" throughout the company.

Now that costing is simple and fast, design engineers have no reason to wait until the end to look at it. And let's be honest here, design and mechanical people don't like the costing aspect of a project. They are excited about designing, creating, and bringing innovation to cool products. So, with aPriori, we've removed a little bit of this painful part of the process for them!

Now, we still don't achieve perfection 100 percent of the time, but with the right tools in place, we are moving in that direction. All in all, those changes to our process has produced big results for Soucy, our partners, and our customers, and none of it would have been possible without aPriori.

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