aPriori

Are You Overpaying for Your Outsourced Parts?

Using Digital Manufacturing Simulation to Optimize and Accelerate Sourcing

WHITE PAPER

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With limited sourcing personnel, complex cost dynamics, and grueling deadline pressures, it is nearly impossible for companies to know if they are paying the best possible price on every one of their outsourced parts.

While this deficiency has been tolerated in the past, constant pressure on corporate performance, combined with increasing material, labor, and energy costs, is forcing companies to pay closer attention to prices charged by external suppliers for parts.

Now, a global crisis is disrupting supply chains and introducing more challenges than ever.

Fortunately for sourcing experts, innovative software solutions are making it possible for them to ensure consistently optimal pricing for all their outsourced parts and products.

EXECUTIVE SUMMARY

If you are responsible for sourcing parts to off-site manufacturing facilities, you know how daunting the process can be. With hundreds or thousands of parts, multiple suppliers, quality requirements, and tight deadlines, it is difficult to truly know whether you are getting the best deal on every single part. Today, a global crisis is upending many supply chains, making this sourcing complexity more challenging and time-sensitive than ever.

Sourcing professionals at most companies face tremendous time pressures. They also have to make sure the parts have acceptable quality and a good price. The sourcing professional must often source an overwhelming number of parts in a short time. It is not surprising, then, that even those who are extremely adept will not always find the lowest cost supplier or one with more efficient manufacturing processes.

Another big challenge is that when sourcing professionals are under pressure to squeeze out more cost savings, how could they ever know if they are asking for re-quoting or re-sourcing the parts with the greatest opportunity for cost savings? Many parts have little potential for savings but a few parts may be opportunities for significantly larger savings. The challenge is knowing which parts have the potential for the most savings so that they can be analyzed in more detail.

But new technology tools are enabling new methods for sorting through this complexity to identify savings rooted in a detailed analysis of the relevant part, its role in the overall design, and its underlying production process.

In this white paper, we take a look at a simple, effective methodology for identifying which parts are driving cost inefficiencies, prioritizing them, and finding a more efficient supplier price (whether through renegotiation with your existing supplier, changing to a more cost-effective manufacturing process, searching for a new supplier or re-designing the product).

These workflows can all be fulfilled through manual analyses, but these are time-consuming and often imprecise. More importantly, they don't provide a method for understanding how costs are driven by specific design and production choices. Digital manufacturing simulation provides a powerful alternative, using digital representations of products, parts, and simulated digital factories to provide far faster, more precise analysis.

Software with manufacturing simulation capabilities can dramatically accelerate should costing analysis, identify opportunities for added savings, and even provide automated suggestions for cost reduction. It also provides the ability to share data seamlessly between design engineers, sourcing professionals, and suppliers.

These capabilities are more significant than ever in the face of a global crisis. Digital manufacturing simulation software is a powerful solution for sorting out current supply chain disruptions. But it's also a long-term investment with the potential to drive substantial long-term ROI by growing margins and helping build more efficient products for years to come.

ARE YOU PAYING TOO MUCH FOR OUTSOURCED PARTS?

When discrete manufacturing companies outsource parts production to external suppliers, there is almost no way to know whether they are paying the best price for every part. In some cases, the company may pay more than it should because there is not enough time to solicit bids from other factories. In others, a supplier may lack the manufacturing capabilities/machines that could make the part more efficiently and, therefore, more cost effectively.

Too often, sourcing professionals rely on historical cost data in their dealings with suppliers. But with material prices changing every day, new factories coming online overseas, and a host of other fast-moving factors, historical data does not always reflect today's realities. Meanwhile, even historical datapoints that were reliable for decades are now being disrupted by a global crisis driving an unprecedented disruption for supply chains.

So, is your company paying too much for your outsourced parts? With hundreds or thousands of parts, you can't know every possible option available and you don't have the bandwidth to solicit quotes from every possible vendor. With so many variables, it is difficult for anyone to know for certain if you are getting the best deal.

What if you could always get the best deal? Sourcing professionals are in a prime position to save their company money. That's why sourcing teams have annual cost-reduction goals. But while target goals have continued to rise, the sourcing function's ability to effect change has not.

Two obstacles prevent sourcing teams from maximizing their cost-saving efforts: inadequate bandwidth and a lack of quality cost information. The time factor is self-explanatory: small sourcing staffs, too many suppliers in too many countries, and too many parts add up to too little time. Additionally, sourcing professionals lack information that would help them easily identify cost-saving opportunities as well as conduct more meaningful (and fruitful) negotiations with suppliers.

To continue meeting cost-reduction goals, sourcing professionals require new capabilities to offset the ever-increasing complexity of their tasks.

Easily identify where you are overpaying for outsourced parts.

Negotiate better with suppliers.

Quickly and easily identify and confirm opportunities that can result in significant savings in product costs.

TECHNOLOGY TOOLS FOR ENHANCED SOURCING CAPABILITIES

Technology tools are the key to overcoming the obstacles discussed above. The right tools will help save dramatic amounts of time, enable data-rich collaboration with suppliers and design engineers, and even automatically identify opportunities for cost reduction.

Digital manufacturing simulation is a powerful, novel approach to attaining these benefits. Digital manufacturing simulation software allows sourcing professionals to analyze the complete set of manufacturing operations required to produce a part. The ability to compare simulated manufacturing cost models to current supplier prices and production practices dramatically enhances sourcing capabilities.

With the ability to quickly model and compare costs for alternatives, this software overcomes both bandwidth and data-sharing limitations. It does so through providing real-time information on what a part should cost, and how potential changes to design or production should influence this cost.

BEST PRACTICES FOR DRIVING COSTS OUT OF OUTSOURCED PARTS

Identify and Prioritize Parts with the Greatest Savings Potential

When optimizing costs for outsourced parts, the first step is to identify the parts or sub-assemblies with the potential for the greatest savings. Identifying these cost-outlier parts is a science in itself.

Historically, this science relied on manually analyzing basic part information and simple comparison metrics, such as historical cost versus mass or cost versus complexity. In the absence of tools capable of actually simulating production for different parts, these manual methods are a viable method for identifying cost-savings opportunities.

The right software, however, will work far faster, analyze more parts, and make use of much more sophisticated filters. Regardless of the method employed, this first step narrows the total universe of parts to a smaller group that offers the potential for big savings.

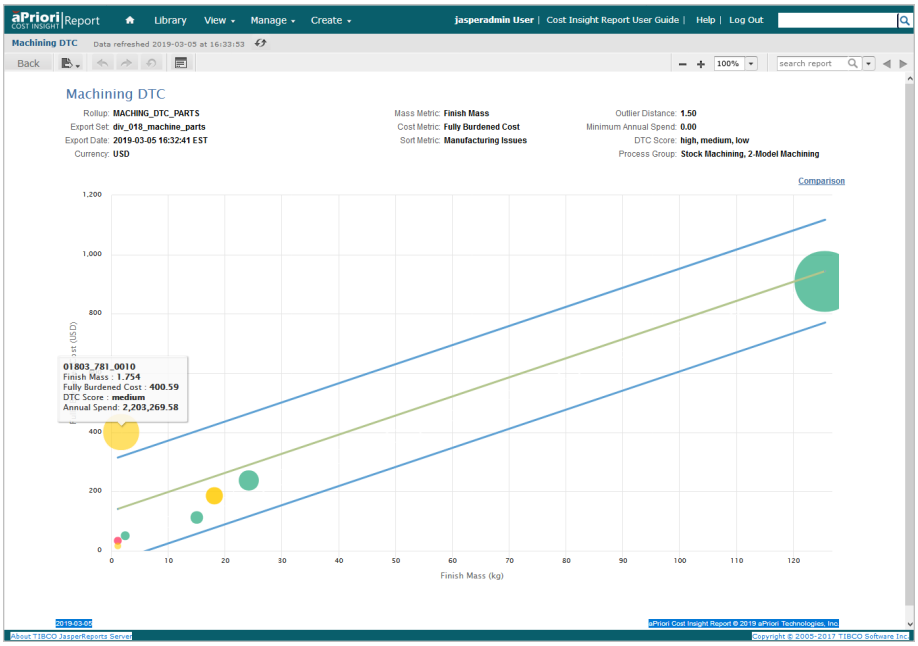
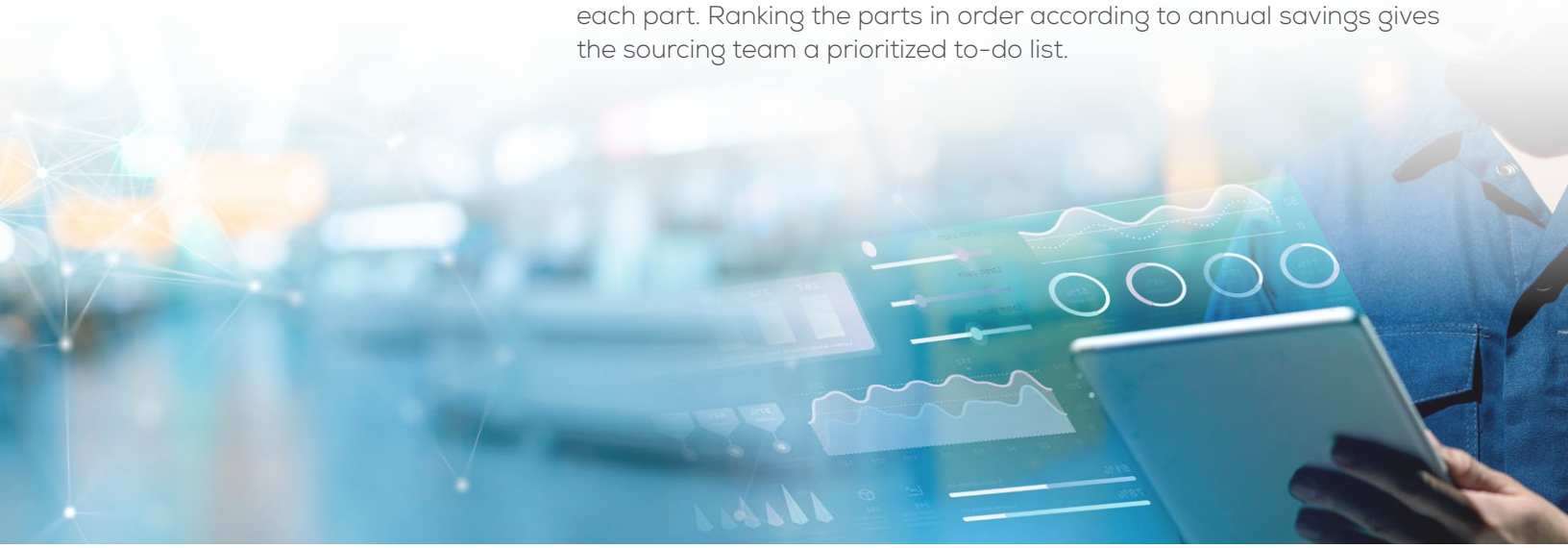


Figure 1. Simple part comparisons, such as cost versus mass, can easily identify potential opportunities to save costs. Using digital manufacturing simulation tools, this analysis can be performed much faster.

With candidates for savings identified, the next step of the process looks at each part and quantifies its cost-savings opportunity. The key to this second phase is knowing what it should cost to manufacture the part in question. When you know what it should cost to manufacture the part in an efficient supplier market (across various geographies), you can compare that amount with the price currently being paid and quickly identify the parts that are out of line.

Here, digital manufacturing simulation software provides sourcing professionals with should-cost knowledge based on efficient production. Multiplying the difference between the historical cost and the should-cost by the annual product volume provides a total potential savings for each part. Ranking the parts in order according to annual savings gives the sourcing team a prioritized to-do list.



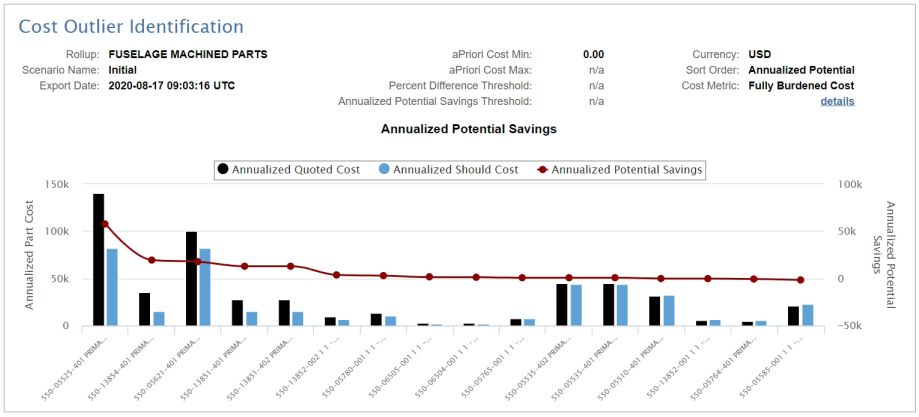


Figure 2. By comparing the current price being paid to "should-cost" numbers, sourcing experts can easily identify outliers and quantify savings opportunities.

Part	Annual Volume	Historical Cost	Annual Spend	aPriori Cost	Savings
AX202-101	16704	$ 137.72	$ 2,300,509.31	$ 135.49	$ (37,217.07)
AX202-102	14899	$ 26.97	$ 401,826.03	$ 24.04	$ (43,713.67)
AX202-103	1692	$ 229.63	$ 388,533.96	$ 194.96	$ (58,654.87)
AX202-142	8928	$ 34.91	$ 311,676.48	$ 32.65	$ (20,159.42)
AX202-156	8918	$ 34.78	$ 310,168.04	$ 33.86	$ (8,168.89)
AX202-178	4329	$ 60.91	$ 263,648.94	$ 51.11	$ (42,419.30)
AX202-179	6392	$ 40.33	$ 257,789.36	$ 26.54	$ (88,120.11)
AX202-202	6306	$ 37.51	$ 236,547.44	$ 33.79	$ (23,446.64)
AX202-132	35762	$ 6.32	$ 226,015.84	$ 4.21	$ (75,386.30)
AX202-104	3560	$ 60.91	$ 216,809.15	$ 51.11	$ (34,883.10)
AX202-404	3756	$ 52.40	$ 196,814.40	$ 44.71	$ (28,876.13)
AX202-679	2855	$ 59.19	$ 168,957.86	$ 45.14	$ (40,094.31)
AX202-10T	48688	$ 2.88	$ 140,220.00	$ 0.72	$ (105,165.00)
AX202-132	27717	$ 3.08	$ 85,367.59	$ 1.61	$ (40,799.06)
AX202-555	27717	$ 3.08	$ 85,367.59	$ 2.93	$ (4,212.95)
AX202-70M	1612	$ 51.35	$ 82,776.20	$ 46.03	$ (8,572.62)
AX202-1001	2966	$ 25.76	$ 76,404.16	$ 22.08	$ (10,914.88)
AX202-491	1183	$ 55.79	$ 65,999.57	$ 55.73	$ (73.35)
AX202-349	186	$ 339.95	$ 63,230.70	$ 246.13	$ (17,450.15)
AX202-224	7294	$ 7.00	$ 51,058.00	$ 6.47	$ (3,880.41)
AX202-119	1691	$ 26.08	$ 44,101.28	$ 22.22	$ (6,520.50)
...					
AX202-210	2294	$ 7.73	$ 17,732.62	$ 5.57	$ (4,959.63)
AX202-4T	1087	$ 6.85	$ 7,445.95	$ 4.34	$ (2,724.02)
Totals			$ 15,514,229.65		$ (718,476.11)

Figure 3. By comparing current costs versus "should-cost," you can quickly determine the potential savings for a universe of parts.

Again, the key to this step is having access to a robust should cost estimate for each product, which is difficult to generate without the right tools. Company cost experts can manually assess what it should cost to make a few parts, but not the hundreds or thousands that most companies utilize.

With digital manufacturing simulation, should-cost information is extremely fast and automatic. Just point aPriori at a directory with the CAD files, and a file that contains all of the current pricing for those parts, and aPriori can analyze hundreds or thousands parts at once, freeing your sourcing team up to focus on how to best leverage the results.

The most advanced manufacturing simulation software not only determines how much the part should cost, but also details the most efficient (lowest cost) manufacturing processes for producing the part based on production volumes, materials, factory locations, and more. As a result, the sourcing team not only has a target price, but also a wealth of supporting information that can be used in any re-quoting, re-bidding, or re-negotiating processes with suppliers.

Re-Quote, Re-Route, or Re-Design Parts

The first two steps of the process identify parts that are strong candidates for cost savings and prioritize the parts based on total potential savings. The next step determines how to drive cost out of these parts. There are usually three options – re-quote, re-route, and/or re-design.

The easiest way to save money on your parts is to find ones where you are simply paying too much. (A common example would be if you are paying for production parts at a rate originally quoted for the prototype volume.) Regardless of the reason, your analysis has identified parts that cost more than they should.

Accurately identifying cost reduction opportunities requires the ability to accurately simulate the manufacturing processes used to create these parts. Simulation software uses a "digital factory" based on a detailed simulation of the actual production processes, materials, and specifications being employed. The parameters of this digital factory are analyzed in-depth based on a "digital twin" of the part in question, tying cost-structure directly to production- and design-level decisions.

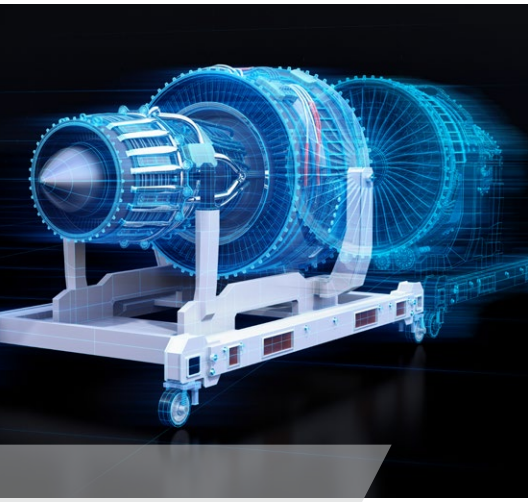
Instead of relying on historical indicators that provide only vague guideposts, this simulation-based approach allows sourcing professionals to precisely project should costs based on current production realities.

First, use digital manufacturing simulation to check if the part is being manufactured using the most efficient process available and you are simply being overcharged for a part. In this case, re-negotiating with the current supplier (or finding a new one) usually results in a lower price.

BRAKE ROTOR - SUPPLY ALTERN...	BRAKE ROT...		BRAKE ROT... Basis			BRAKE ROT... Basis	
Info and Notes	MexCas...		TexCast			Brazilia...	
Description:							
Last Saved: 5/5/20, 3:22 PM							
Saved By: Dave McDermaid							
Cost Results							
Material (USD)	99.98%	88.07	99.97%	148.39	68.48%	99.97%	84.26
Labor (USD)	0.00%	0.00	0.00%	0.00		0.00%	0.00
Direct Overhead (USD)	0.00%	0.00	0.00%	0.00		0.00%	0.00
Indirect Overhead (USD)	0.00%	0.00	0.00%	0.00		0.00%	0.00
Investment (USD)	0.02%	0.02	0.03%	0.04	92.15%	0.03%	0.02
Other (USD)	0.00%	0.00	0.00%	0.00		0.00%	0.00
Components (USD)							
Assembly Processes (USD)							
Fully Burdened Cost (USD)		88.09		148.42	68.49%		84.28
Target Cost (USD)							
Total Capital Investment (USD)		9,818.94		18,867.54	92.15%		11,406.23

Figure 4. aPriori allows you to quickly and easily generate fully burdened cost estimates from multiple suppliers in multiple regions.

In some situations, the supplier may not be manufacturing a part as efficiently as possible, driving up the cost to your company. (A simple example would be a supplier who doesn't have a laser, so parts are cut using a more-expensive turret press operation.) If suppliers are using sub-optimal methods to make a part, asking them to re-route (and then re-quote) using the suggested methods should result in a lower price.



Re-routing can often necessitate re-sourcing if the current supplier does not have the required capabilities. Although possibly more time consuming, re-routing often holds greater savings opportunities than re-quoting or re-bidding alone. In some instances, the initial analysis will identify parts that appear to cost more than they should, but the most efficient manufacturing processes are already being used and the price based on these processes is reasonable. In these cases, the reason for the higher price may be that the part was not designed as efficiently as possible. These parts become candidates for re-design.

Re-design opportunities include reducing the complexity of the part, changing material, converting weldments to castings (or vice versa), investigating stampings, and more. Re-design has more potential cost savings than re-quoting or re-routing, but in most cases will involve work from engineering to determine the best new design options. This step also may require re-testing for durability and other attributes on the new part.

Effective re-design requires detailed, timely data-sharing between sourcing professionals and design engineers. **A digital factory approach addresses this need head on, enabling data-rich collaboration on the full digital manufacturing thread that links design to final production.** With a simulated factory, supply professionals can quickly see how new alternatives proposed by design engineers affect a part's should cost.

When suppliers propose alternatives, these production choices can also be simulated to ensure that new quotes represent an efficient price point.

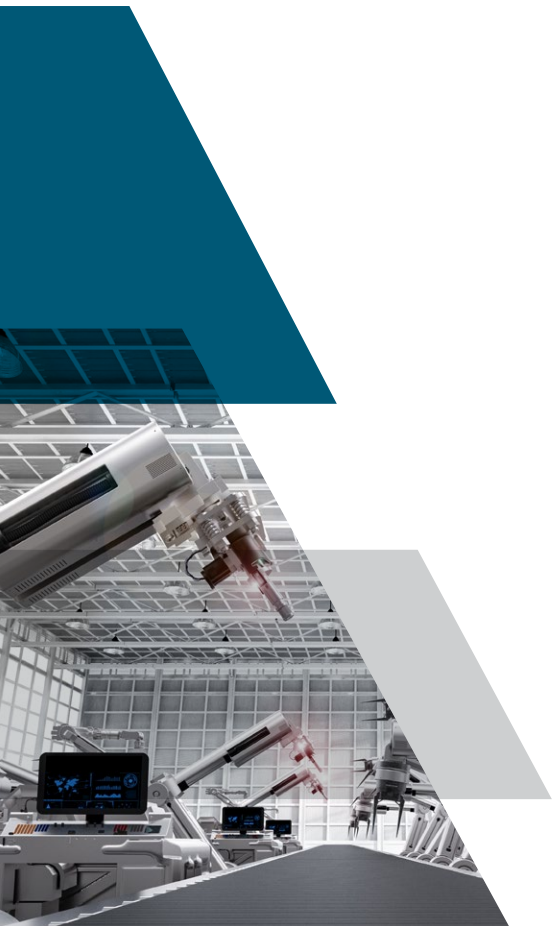
Design for manufacturability opportunities include reducing the complexity of the part, changing material, or evaluating other manufacturing strategies.

SUMMARY

The preceding steps are designed to help companies locate and take advantage of efficient opportunities for cost savings. While the effort to attain these savings is often minimal, the financial impact can be enormous.

Most importantly, with digital manufacturing simulation software in place, sourcing team members can be sure they are getting the best deal for each new product they outsource to suppliers. Going forward, the sourcing team will have more confidence that all of the new parts are priced correctly from the start and there will be fewer and fewer instances where the company needs to re-quote, re-route, or re-design products.

Chances are that your company is overpaying for a portion of the parts you outsource to suppliers. Using new simulation-driven technologies along with a simple methodology, your organization can identify and confirm opportunities for significant cost savings, conduct fact-based negotiations with suppliers, source new parts at the best price from the start, and avoid overpaying for parts again.



aPriori

300 Baker Avenue
Concord, MA 01742

Tel: 978.371.2006
Fax: 978.371.2008

www.aPriori.com
hello@apriori.com

aPriori is the leading provider of digital manufacturing simulation software that brings product design and sourcing teams closer to production. By leveraging the digital twin within our digital factories, we automatically generate design for manufacturability (DFM) and design for cost (DTC) insights, helping manufacturers collaborate across the product development process to make better design, sourcing and manufacturing decisions that yield higher value products in less time. aPriori solutions are now available either in the cloud or on-premise.