

Respond Faster to Manufacturing Customer RFQs



The quoting process has been a longstanding source of operational friction for manufacturers, and recent supply chain disruptions have highlighted the drawbacks of time-consuming manual quoting processes.

In this guide, we provide an overview of some of the biggest issues with today's RFQ processes—issues which are only compounded by the fast-moving supply chain disruptions that are becoming increasingly commonplace in today's highly interconnected global economy.

Fortunately, manufacturers have novel opportunities to dramatically speed up quoting. In this guide, we explore how suppliers can harness digital manufacturing software to optimize the quoting process. Finally, we explain how digital manufacturing can drive faster, more accurate quotes, while enabling the development of more strategic, collaborative customer relationships.

01.

The Growing Impact of Supply Chain Disruption for Suppliers & Quoting Professionals

The pandemic created unprecedented supply chain disruptions, with lingering backups and slowdowns that manufacturers are still working to unwind. Even before the pandemic, events like recent trade wars demonstrated how sudden disruptions with far reaching implications are a new normal, with new risks for today's highly interconnected, just-in-time supply chains.

Impact for Manufacturing Suppliers

Manufacturing suppliers have been moving toward just-in-time (JIT) supply chains for years. While JIT methods are a valuable solution for reducing inventory costs and keeping less raw materials on hand, they depend on a carefully orchestrated network of suppliers who can quickly accommodate fluctuating demand.

This highly synchronized network can prove fragile in the face of unanticipated disruptions. If it breaks down, manufacturing suppliers are faced with an urgent need to source cost-effective alternative parts. For a more specific look at managing supply chain disruptions using digital manufacturing software, please see our blog [here](#).



Impact for Quoting Professionals

A supply chain disruption can create new opportunities for the manufacturers who are best able to adapt. While they may make raw material and component inputs more difficult to source, disruptions also increase the volume of new potential customers who can no longer rely on existing supplier relationships. These companies will need to source a new supplier fast, and manufacturers who can respond with timely, accurate, and reliable quotes will be best positioned to win this business. In this context, quoting professionals are under more pressure than ever to deliver fast, high-quality quotes to win new business.

Many quoting processes today, however, are not well positioned to take advantage of this sort of fast-developing opportunity. We explore why in the next section.

02.

Why is Quoting Taking So Long? Five Common Problems That Bog Down the RFQ Process

The prototypical quoting process today is slow, inconsistent, and time-consuming—issues that can directly result in lost opportunities. In the past, however, quoting teams simply had no alternatives to the sort of manual quoting process associated with the problems described below. But today, manufacturers can leverage digital manufacturing simulation to address each of these challenges.

Legacy RFQ Process Problem One: Manual & Time-Consuming

Manual costing is very time-consuming. A quote for a complex order may require weeks of time from a skilled, high-cost professional. These time demands result in not only a substantial delay to returning customer quotes, but huge amounts of expensive labor time going into administering and inputting data into piles of complex quoting spreadsheets.



Legacy RFQ Process Problem Two: High Retirement Rates for Quoting Professionals

The intensive time demands of manual quoting are only compounded by the fact that experienced quoting professionals are retiring in droves. Retirements drive an urgent need for manufacturers to reduce the hours and personnel required to support quoting. They also create a new need to ensure that systems are in place to capture the hard-won knowledge that risks going to waste as experienced professionals retire. Manual quoting processes are often reliant on personal rules of thumb, individual knowledge, and extensive industry experience (and the nuanced eye for manufacturability issues that comes with it).

Legacy RFQ Process Problem Three: Inconsistent Quoting

A manual process can be rife with judgement calls and inconsistent practices that can introduce substantial risks. If a quoting professional doesn't recognize a potential manufacturability problem, forgets a special finishing treatment, or provides a different number than another quoting professional on the same team, it can cost a fortune to remedy.

Legacy RFQ Process Problem Four: Budgetary Requests that Don't Lead to New Business

Many RFQs are disguised budgetary requests which are unlikely to lead to an actual award. These requests, however, are still time consuming, and detract from the time needed to respond to “real” RFQs that will ultimately drive revenue.

Manufacturers need faster, more automated quoting capabilities to save time while allowing quoting teams to focus on the requests most likely to drive real new business.



Legacy RFQ Process Problem Five: Losing Opportunities to Competition with Faster Quoting Capabilities

The issues discussed above all detract from the efficiency and accuracy of the quoting process. Taken together, they can be even more damaging to business development.

When a customer needs to source a new part fast in the aftermath of a supply chain disruption, they won't have time to conduct an exhaustive supplier selection process or wait months for the most competitive possible bid. Instead, the supplier who responds fastest will often win simply because they provided a timely, plausible bid. A slow, labor-intensive quoting process prevents a supplier from responding to every attractive opportunity—if quoting teams are already working overtime, otherwise valuable RFQ's may be ignored out of necessity.

This “first to win” issue only increases the pressure on quoting teams to work faster than ever. Without new technological capabilities, however, added pressure can do little to accelerate manual quoting processes that are already being pushed to the breaking point.

“We have a saying: First in gets the business. And with a nine-day pricing model, we were far from first...With aPriori, 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.” —Soucy

03.

How the Digital Thread Optimizes RFQ Response

To speed up quoting and open new possibilities for collaborative customer relationships, manufacturers need a faster quoting process that provides a direct connection between customer product designs and internal quoting teams.

We call this software-based connection a “digital thread.”

What is a Digital Thread?

The digital thread refers to a connection between all digital elements of the product development lifecycle. Each element leverages data embedded in the product model from the previous step in the process. For example, aPiori digital factories leverage all of the geometric cost drivers and product manufacturing information embedded in the 3D CAD model to drive a comprehensive manufacturing simulation. With this mission critical capability, suppliers can simulate production of client designs, speeding up quoting while generating deep insight into product manufacturability and cost structure. To learn more about how a strategic approach to digital transformation utilizing a digital thread helps manufacturers to accelerate product development, cut sourcing and production costs, and gain insights to sidestep supply chain bottlenecks, read this article [here](#).





What is a Digital Factory?

A digital factory is a virtual representation of a physical factory. Using digital manufacturing simulation, engineers and quoting professionals can identify manufacturability and cost issues directly from data which is automatically extracted from a 3D CAD. For a deeper look at digital factories, how they work, and how they're helping manufacturers today, please see our guide [here](#).

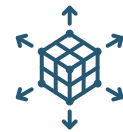
By simulating production of a “digital twin” for the actual product being designed or quoted, digital manufacturing simulation software can extract key cost drivers from information including:



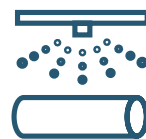
Geometry



Properties



Tolerances



Surface Finish



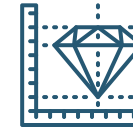
Material




Weight



Complexity



Size



This data can be used to rapidly generate comprehensive manufacturing intelligence, including everything from subtle design characteristics, to labor costs, to processing times for the specified routing. Digital factories can be customized to reflect internal manufacturing capabilities, those of a supplier, or representative manufacturing costs and capabilities for different regions of the globe (for example, aPriori provides 79 benchmark digital factories representing the cost structures of manufacturing facilities around the world). Because simulation can produce manufacturing intelligence in near real-time, it opens up new possibilities to quickly compare design alternatives. As the CAD model is changed, new manufacturing intelligence is generated, allowing engineers to iterate and find the design with the optimal cost-value combination.

For organizations that design products in house, digital manufacturing simulation can generate design for manufacturing (DFM) and design to cost (DTC) insights early in the design process, when product development teams still have the most room to change the design.

Digital factories can be equally valuable for contract manufacturers. Simulated manufacturing generates near real-time insight into the full breadth of a design's cost drivers, allowing quoting teams to work much more quickly and accurately. And, as we explore in more detail later in this guide, simulated manufacturing allows suppliers to offer customers true value-added insight into the manufacturability of a design (and how it can be improved).

Quoting Software for Manufacturing: How to Utilize the Digital Thread to Respond to RFQs Faster and In More Detail

Instead of spending weeks analyzing a design, quoting teams armed with digital manufacturing simulation software like aPriori can start by simply uploading the relevant CAD file. Within seconds, or minutes for a complex design, the digital factory can provide a detailed cost breakdown, alerts for potential manufacturability issues, and even automatic recommendations for rectifying root issues of excess costs.

This highly detailed manufacturing intelligence allows for unprecedentedly precise, accurate, and repeatable quoting. A quoting process powered by digital manufacturing can:



Respond more quickly to customer RFQ's



Avoid quoting errors which can prove hugely costly (if underbid) or result in lost business (if overbid)



Preemptively identify manufacturability issues before they emerge as crises on the factory floor

But these direct benefits to RFQ response are only one aspect of the ultimate value of digital manufacturing for suppliers. The digital thread allow manufacturers to connect internal quoting teams with customer engineers better than ever before.

A Digital Thread Allows Manufacturing Intelligence to be Leveraged Across the Entire Value Chain

The aPriori digital manufacturing simulation platform generates and stores manufacturing intelligence that benefits both the customer and the supplier. By connecting customer CAD files to fully configurable digital factories, contract manufacturers can dramatically enhance their ability to provide additional value to customers.

The digital thread offers a better way to share and collaborate on design data. Instead of simply providing a quote, manufacturers can use results from simulated manufacturing to show customers precisely how design choices are interacting with final product cost.

As a first order benefit, this allows for highly explainable quotes. If a bid comes in higher than the customer expected, they can see why. A data-rich, simulation driven-cost model reduces the risk that customers will blame a high bid on a supplier attempting to pad margin. Instead, the digital thread creates new opportunities to show customers how they could design a more cost-effective product.

Over time, the benefits of the digital thread expand from explanation to collaboration. Digital manufacturing simulation supports the development of a long-term customer relationship that transcends black-box quoting, tactical bidding, and adversarial negotiations.

Below, we explore two ways that digital manufacturing simulation software can help manufacturers build more strategic relationships with their customers. First, a simulation-driven analysis of what a design “should cost” allows for fact-based negotiations that replace gamesmanship with hard manufacturing data. Second, digital manufacturing simulation allows manufacturers to offer value-added manufacturability feedback on client designs.



04.

Use Automated Should Cost Analysis Capabilities to Inform Negotiations

We cover the fundamentals of should cost analysis as it relates to the quoting process below. For a more in depth look at this topic, please see our Guide to Should Cost Analysis and Negotiation [here](#).

What is a should cost analysis?

Should cost analysis is the actual process used to generate a “should cost” projection: a model of the total cost of a given component if efficient manufacturing processes are followed.

No manufacturer can achieve the efficiency represented by an idealized should cost model, and “should cost” is not the same as “will cost.” But an accurate should cost estimate provides a valuable strategic benchmark for quoting, negotiating with suppliers, and evaluating the efficiency of internal or external production processes.



What Are Automated Should Cost Capabilities?

Today, using simulated manufacturing in a digital factory, should cost models can be generated automatically while analyzing a huge number of nuanced, interactive cost drivers. Everything from labor rates, to material costs, to part geometry and cooling time plays a role in determining final product costs, and digital manufacturing simulation can analyze all of these factors in near-real time.



Using Should Cost Models to Conduct Fact-Based Negotiations

A quality should cost model provides detailed intelligence on the cost structure of a product. If this intelligence is shared between both supplier and customer, it can become fuel for a fruitful, fact-based negotiation.

Fact-based negotiation is the practice of focusing on mutually beneficial should cost data when discussing a quote. Instead of negotiation tactics and gamesmanship, both parties can focus on the actual cost drivers underlying the quote. The should cost model provides an anchor for these discussions, highlighting where costs can be brought down by a design tweak, tooling investment, or alternative material choice.

Ultimately, fact-based negotiations are valuable for supplier and customer alike. For buyers, they help push toward the best price possible and iron out inefficient design choices.

And these negotiations help suppliers develop more efficient manufacturing processes, win more business, and offer the most competitive prices possible. Manufacturers who use digital manufacturing simulation to work with customers can use these same capabilities to work with their own suppliers as well. You can learn more about this side of the story in our blogs on [How to Collaborate with Suppliers to Reduce Product Cost](#) and [How to Use Fact-Based Negotiation to get the Best Price on Existing Components](#).

Digital manufacturing simulation is the perfect capability to facilitate fact-based negotiations because it doesn't just report that a cost is too high. Automated manufacturability analysis allows it to go much further, identifying design choices that are driving up costs (and even automatically recommending more efficient alternatives). **We explore manufacturability in greater detail in the next section.**

05.

How to Identify Manufacturability Issues Early in the Quoting Process

The earlier manufacturability issues can be identified, the more time designers have to devise a workaround. By identifying these issues as early as possible, such as when a product goes out for early manufacturing cost quotes, a supplier can not only provide a prompt quote, but actionable design recommendations on factors which could allow for a more efficient price point.

What is design for manufacturing?

Design for manufacturing (DFM) is the practice of designing products to optimize their manufacturing ease and cost given their form, fit, and function requirements. This practice centers on preemptively identifying manufacturability issues in a design, so it is often referred to as “design for manufacturability.”

Our guide [here](#) provides a much deeper look at maximizing the impact of DFM practices in your organization.



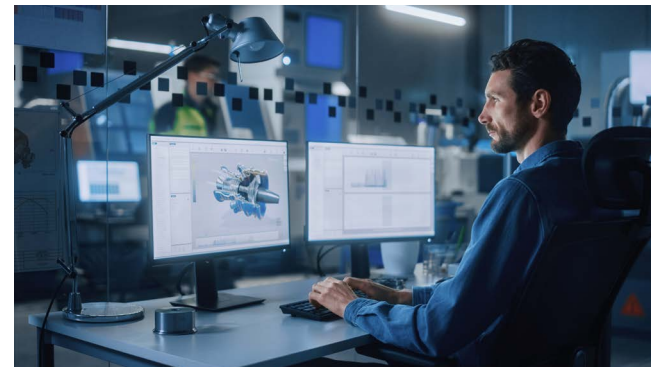
How Design for Manufacturing Software Can Help Contract Manufacturers

Design for manufacturing software is an essential component of a DFM strategy. Design engineers cannot be expected to anticipate all possible subtle manufacturability issues across a huge variety of different production processes, and software assistance via digital manufacturing simulation is essential for catching manufacturability issues when a product is still being designed or quoted.

Using CAD Manufacturability Heat-Mapping Software

Manufacturability heat-mapping is a great example of a feature that can help suppliers quickly spot issues with customer designs. For example, aPriori's Geometry Analysis Tool allows engineers to quickly identify the geometric cost drivers (GCDs) that are most expensive to manufacture. An easy-to-interpret heat map can be overlaid onto the CAD model to support visual identification of manufacturability issues.

You can learn more about this capability in our case study [here](#).



Design for Manufacturing Software: Benefits for Suppliers

While contract manufacturers may not usually be involved with the product design process from the earliest stages, they can glean substantial value from design for manufacturing capabilities. A digital factory can be used to catch manufacturability issues minutes after a CAD file is submitted for an RFQ.

With DFM insights in hand, quoting teams can provide customers with not only a quote, but a list of proactive recommendations for bringing down product costs by eliminating potential manufacturability issues. Suppliers can effectively function as fast-response manufacturability experts for customers that lack their own digital manufacturing simulation capabilities.

This capability helps build trust with customers, and it incentivizes customers to involve the supplier earlier in the product development process. Earlier involvement gives suppliers more opportunities to collaborate on cost-effective product design and secure manufacturing business for products that are still in the early design stages.

In a matter of months, HARBEC implemented customized quoting capabilities for their critical manufacturing processes in aPriori. They now benefit from fully automated quoting across injection molding, mold building, CNC machining, and additive manufacturing.

HARBEC's new automated approach is resulting in highly accurate cost models for virtually every quote. [Read the case study here.](#)

06.

The Benefits of Automated Bulk Costing for Contract Manufacturers



Even with a digital factory, suppliers may not have time to manually run every CAD file in their existing portfolio through a comprehensive manufacturing simulation. aPriori also provides automated bulk cost modeling capabilities that can be quickly utilized on large numbers of parts. Techniques like cost versus mass analysis are helpful for identifying outliers, parts with a higher than projected cost given their material, production process, and weight. These outliers are then high-value targets for deeper analysis in the digital factory existing products.

Suppliers can root out manufacturability issues or unnecessarily costly design choices in the product they are already manufacturing and work with customers to bring costs down. Bulk costing helps ensure that suppliers can offer customers the most efficient possible manufacturing options for both new RFQ's and longstanding contracts.



Our demo here takes a deeper look at bulk costing capabilities in action.

07.

The Future of Manufacturing: Becoming a Trusted Supplier & Business Partner



Faster Detailed Quotes



Value-Added
Manufacturability Insights



Support for
Fact-based Negotiations

Instead of simply manufacturing products to spec, a supplier with digital manufacturing capabilities can operate as a trusted product development resource for customers. The more involved a supplier can be with customer product development, the more of an advantage they can acquire for winning new business and unlocking new revenue streams from that customer.

Proactive manufacturability insights, accurate quotes, and fast RFQ response times can establish a manufacturer as a preferred supplier for future business.

A trusted, digitally connected supplier can provide cost-effective manufacturing while offering clients **the long-term ability to collaborate to reduce cost and build better, higher-performing products.**

To Learn More About aPriori:

How it works, and how it is helping manufacturers quote faster, build more cost-effective products, and unlock new opportunities for customer collaboration, visit [aPriori.com](https://apriori.com).



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