

The logo for Tech-Clarity, featuring the word "Tech-Clarity" in a bold, sans-serif font. "Tech-" is in white and "Clarity" is in yellow, both set against a dark blue rounded rectangular background.

Tech-Clarity

**Tech-Clarity Insight:
Improving Profitability for
Configured Products**

***Leveraging Sales
Configuration and Design
Automation***



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Executive Overview

Manufacturers have a tough job competing in today's global environment. Global competition, price sensitivity, time to market pressures, and increasing complexity all make it very difficult for manufacturers to be successful. Competitively differentiating your business and its products is hard while facing all these pressures. In addition, customers expect more.

To capitalize on this trend, a company can set itself and its products apart by tailoring products to customer needs with a Design to Order (DTO), Configure to Order (CTO), or Engineer to Order (ETO) strategy. Among the many benefits, customization and personalization:

- Offer customers exactly what they want
- Create competitive differentiation
- Enable a price premium

All of these factors lead to greater profitability.

For some companies, ETO is less about differentiation. Instead, it is a basic necessity in their industry. In these cases, it's not enough to set products apart through customization, because everyone does that. In these industries, you need to come close to offering customized products as effectively as others who offer standard products.

A sales configurator integrated with design automation can be a way to profitably customize products. It can improve a customer's experience, save time, and offer customers exactly what they want in an economical way

Regardless of the reasons driving "to order" manufacturing, to be successful, your company must overcome the inherent complexity. While there are a lot of benefits, complexity can introduce risk, which in turn could lead to higher costs that hurt profitability. It's important to choose the right approach.

As examples of the time savings, Pine Research Instrumentation found that processes that used to take two to four weeks are now instantaneous and Precision Polymer Engineering (PPE) found design cycles are reduced by 35%.

Rob Yule, Director of Engineering at Blue Giant, a loading dock manufacturer, says, "*We believe that manufacturing products locally can succeed long term. However we know we have to automate everything possible to remain competitive.*" A sales configurator integrated with design automation can help profitably customize products. It can improve

a customer's experience, save time, and offer customers exactly what they want in an economical way. In addition to higher customer satisfaction, the business benefits include:

- Higher productivity
- More accurate quotes
- Fewer errors
- Optimized manufacturing processes
- Less waste

As examples of the time savings, Pine Research Instrumentation finds that processes that used to take two to four weeks are now instantaneous and Precision Polymer Engineering (PPE) found design cycles are reduced by 35%.

The integrated solution also offers a competitive advantage. Says Paul Gimbel, Business Sherpa at Razorleaf, *"A sales configurator integrated with design automation gives a company the capability to offer customized products at standard product prices, while the competition is limited to their catalog items."*

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Paul Gimbel, Business Sherpa, Razorleaf

This paper explores how to manage the inherent complexities of "to-order" products. It identifies best practices to profitably customize products and shares the business benefits enjoyed by companies who have implemented them.

Optimize Profitability

Examining the impacts on profitability helps identify improvement opportunities. Companies can increase the demand for their products by offering customers exactly what they want. Greater demand leads to higher revenue and may even make it possible to charge a price premium. Consequently, it's not too surprising that differentiating products through customization is reported as a top strategy in Tech-Clarity's [Best Practices for Developing Industrial Equipment](#), a study of nearly 400 manufacturers (Figure 1).

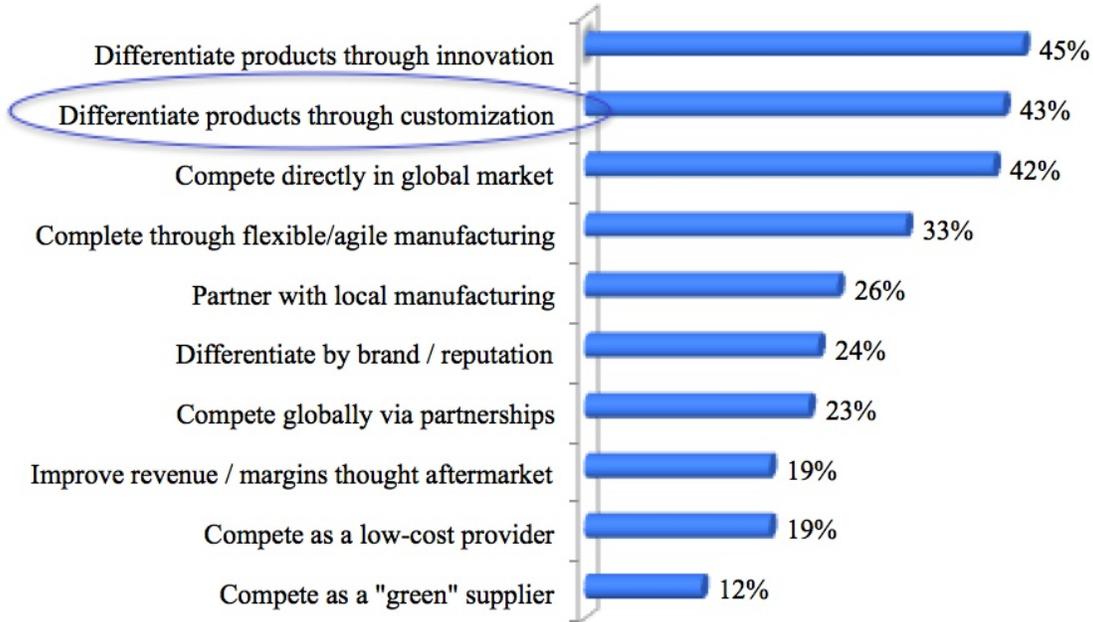


Figure 1: Industrial Equipment Business Strategies

The challenge is managing complexity. Tech-Clarity’s The Five Dimensions of Product Complexity identifies how customizing and tailoring products drives increased complexity. Customization places more demands on each stage of the Engineer to Order process including capturing customer requirements, validating customer order what they need, quoting effectively, and producing the product. While complexity can make it difficult to price correctly, if the quote takes too long, the business may be lost. Customers are under time pressures as well and do not have a lot of time to wait for quotes. The first to respond often has a competitive advantage as that bid may win before others even have a chance to respond. Producing a configured part can also take longer, but if the delivery window is too long, customers may look elsewhere. All of this means less revenue.

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Complexity also means a higher risk of errors and errors drive up expenses. Errors can happen anywhere along the cycle from sales, design, to manufacturing. Going back to fix errors wastes time and can lead to late shipments and potential penalties. In addition, any required rework drives up cost. Errors not caught before the product ships increase return and warranty costs and hurts customer satisfaction.

All of these issues impact profitability. Optimizing profitability requires minimizing these risks.

Support Guided Selling

A key benefit of guided selling is that it takes a buyer through a series of questions to arrive at the right product in a timely and efficient way. A buyer, dealer, distributor, or sales person easily navigate product lines, narrow down the choices, and identify the right product more easily using guided questions. This makes it easier for customers to do business with your company and for you to sell more at a profit.

For any product, guided questions can help a buyer, dealer, distributor, or sales person easily navigate product lines, narrow down the choices, and simplify the process of identifying the right product.

The many options available for configurable products can make it especially challenging for customers to figure out which product they want. Guided selling combined with sales configuration simplifies the complexity by automatically identifying and creating the right product based on needs. Guided selling also provides the framework and rules to ensure the customer is only sold products that can be manufactured.

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Going through a guided selling process can help internal processes too. Without guided selling, capturing the right information during the sales process is not easy. *“Just having a consistent form for sales people to fill out can be a huge benefit,”* says Gimbel from Razorleaf. *“Going back to the customer later to say, ‘We forgot to ask you ...’ is not only embarrassing, it can hurt the customer’s confidence in you.”* Gimbel also explains why a sales configurator can work better than an internally developed manual solution. *“Paper forms or Excel sheets can help, but they do not ensure the form is filled out completely or correctly. For example, what is to stop someone from putting a checkmark in the diameter field?”* asks Gimbel. *“With a sales configurator that supports guided selling, the form is filled out every time and when integrated with design automation, that information will drive the design.”*

Western Truck Body (WTB), a company that designs and manufactures custom truck bodies, has also seen greater consistency. *“The guided input method enabled by our sales configurator has led to consistent quotes and drawings,”* says Travis Waddell, Project Manager at Western Truck Body. Consistent processes lead to better accuracy and also make it easier to continuously improve.

Visualization can also be an important part of the sales process. *“Integrating the order and the design allows you to “show” customers what they are ordering to prevent misunderstandings,”* says Jim Brown, president of Tech-Clarity. *“This gives them confidence in what they’re purchasing, and sets proper expectations because they can confirm what they’re ordering visually.”*

Automate Manufacturability Checks

One of the challenges of selling configurable products is ensuring that the ordered product *can* be manufactured. After 40 years in the window and door industry, Ed Page had visions for innovative window designs, but continuously ran into problems with manufacturability. He had lost faith he would ever successfully produce his product. Now, Chief Engineer at Mullionz, an engineering company for the window and door industry, Ed discovered a sales and product configurator that could do it. *“Now with our sales and product configurator, my product is possible!”* says Page. With the intelligence of the rules-based software, the customer’s specifications drive the production of engineering drawings and manufacturing information. In less than six months, he has gone from having a product that couldn’t be manufactured to delivering over \$500,000 of product and has over \$1 million in booked orders.

With an integrated sales and product configurator, in less than six months Mullionz has gone from having a product that couldn’t be manufactured to delivering over \$500,000 of product and has over \$1 million in booked orders.

The rules of “how products are designed and made” are often based on tribal knowledge and manufacturability checks tend to be manual. With a sales configurator that is integrated with the design, manufacturability rules can be automatically applied so that problems are caught before they become orders. Rules might be based on logic, functions, complex engineering calculations, tables of existing data, legislation or business intelligence.

All of the manufacturability rules that were in my head were brought into our sales and product configurator software. Now at the order stage, not only do we know IF it can be manufactured, but also HOW.

Travis Waddell, Project Manager, Western Truck Body

WTB has found automated manufacturability rules very helpful. *“All of the manufacturability rules that were in my head and checked on paper or in CAD were brought into our sales and product configurator software and those rules now drive the design,”* says Waddell. *“Now at the order stage, not only do we know IF it can be manufactured, but also HOW.”*

WTB also found that automation enables manufacturing optimization. *“Not only did we improve the sales process, but we can minimize waste, use equipment effectively, validate operator ergonomics, and improve productivity,”* observes Waddell. *“All of this has led to even greater levels of company success.”* Adds Brown of Tech-Clarity, *“Of course you can also check sales rules and ensure that regulatory requirements are met in much the same way.”*

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Travis Waddell, Project Manager, Western Truck Body

Streamline Sales to Manufacturing

With a successful integrated sales and product configurator, everything needed to support the order from sales to manufacturing can be produced when the order is taken. Sales information such as pricing, PO routing, images, and delivery estimates can be automated. Engineering information such as drawings, BOMs, CAD models, and supporting documentation are produced with little to no manual intervention. Requirements collected during the sales process are automatically passed on to parameters in the CAD model, which automatically update according to customer specifications. The integration also means that customer specific information is only entered once, saving time and reducing the chance of errors. Further, the ability to generate 3D visualizations of the design during the quoting phase gives the customer greater confidence that what is ordered is what will be received. All of this leads to higher customer satisfaction; and increases opportunities for follow on business. *“Our configurator reduced our quoting and design time significantly,”* says WTB’s Waddell. *“We are now able to quickly enter order details and generate quotes and drawings, making turnaround much more efficient.”*

The integrated solution has reduced the quote process from one or two days to virtually instantaneous. The process of creating drawings, submitting documentations, and releasing to the shop floor has gone from six to ten days to one to two and one-half hours.

Sukhbir Singh, Engineering Manager, Fresno Valves & Castings

By using a sales configurator that combines design automation, Fresno Valves & Castings has seen drastic improvements. *“The integrated solution has reduced the quote process from one or two days to virtually instantaneous,”* comments Sukhbir Singh, Engineering Manager at Fresno Valves & Castings. *“Change requests that took one or two days are now also virtually instantaneous. The process of creating drawings,*

submitting documentations, and releasing to the shop floor has gone from six to ten days to one to two and one-half hours.” These gains have been achieved by managing the complexity of configurable products and improving the efficiency of company operations.

Create More Revenue Opportunities

The efficiency gains of an integrated sales and product configurator can actually lead to more revenue. Not only can manufacturers win over customer loyalty with a higher level of service, they can also deliver more products in the same amount of time. This in turn leads to greater revenue. With their configurator, Bramptons, an elevator manufacturer, can automatically generate contract specific sales and manufacturing documentation. This includes drawings, cutting lists, and 3D representations. *“Customers can now see 3D images and drawings of their elevator. This provides us with a real competitive edge,”* says Neil Dowse, Managing Director at Brampton. *“In the past it would have taken up to two weeks to get back to a customer with a quote and a further three weeks to produce manufacturing drawings. Now we produce everything we need within 24 hours of completing the specification. We are manufacturing four times as many elevators.”* Imagine the positive impact on profitability with productivity gains like that.

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Neil Dowse, Managing Director, Brampton

Fresno Valves & Castings finds that with the help of their sales and product configurator, the company has earned an excellent reputation for performance and they are winning more business because of it. *“Rather than us searching for new customers, they are coming to us,”* says Sukhbir Singh, Engineering Manager at Fresno Valves & Castings. *“We are also winning more bids, even if they are higher, because we can promise better delivery dates.”* Fresno has also seen such great productivity gains, which means that they can take on more work. *“Engineering used to be the bottleneck, but now fabrication can’t keep up,”* observes Singh. *“With extra time, engineering can take on custom design projects no one else wants to do.”*

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Sukhbir Singh, Engineering Manager, Fresno Valves & Castings

More attractive quotes can also lead to more business. With the sales information tied to design, you can quickly add high-end graphics and create brochure-quality, custom quotes. This improves customer experience, company perception and can lead to more business wins.

***With extra time, engineering can take on custom design projects
no one else wants to do.***

Sukhbir Singh, Engineering Manager, Fresno Valves & Castings

Enable ETO Best Practices

In the study, Best Practices for Developing Industrial Equipment Tech-Clarity researchers identified that Top Performing companies saw 2.2 times more revenue growth and 2.4 times more profit margin growth compared to their competitors. With results like this, they have clearly found ways to navigate the challenges of configurable products. Looking at the strategies industrial equipment manufacturers use, many companies sell custom products so it is obviously recognized as an important approach in today's market to meet customer needs. Both Top Performers who hit their product development targets more frequently, and their competitors who are less effective, tailor products to order. What sets apart the Top Performers is how they accomplish customization. Top Performers are more likely to streamline and automate that customization through platform design, modular design, and rules-based design (Figure 2).

Rules-based design makes the biggest difference, which indicates it is an important part of what sets the Top Performers apart and leads to their superior performance.

What sets apart the Top Performers is how they accomplish customization. Top Performers are more likely to simplify and automate that customization through platform design, modular design, and rules-based design.

Travis Waddel of WTB explains why a rules-based approach makes such a big difference. *“With our rules-based solution, we’ve captured all the rules and exceptions, which used to be in my head, into an automated system,”* says Waddel. *“This has transformed a very manual process, dependent on one person, to a faster automated process.”* This level of automation creates a real competitive advantage.

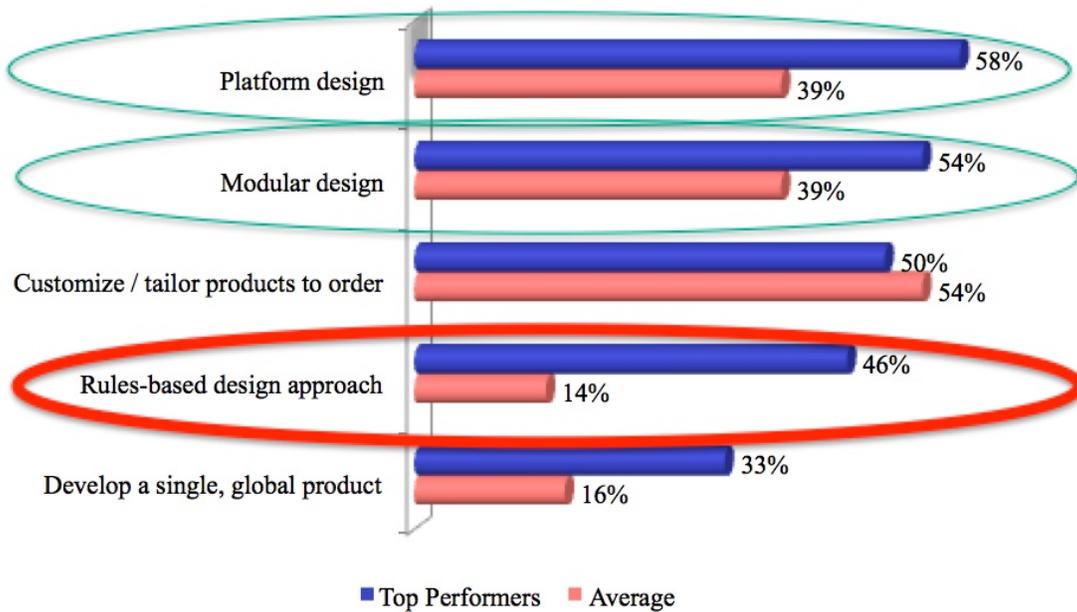


Figure 2: Engineering and Product Development Approach

For ETO products, technology plays a key role in Top Performers’ success. Top Performers are 45% more likely than their less successful competitors to use configuration / design automation technology. *“Manufacturers that provide mass customized products that do not streamline their processes and tools will suffer from increased costs, long lead-times, and lost sales,”* says Tech-Clarity’s Brown. *“Manufacturers that automate best practices will benefit by increasing their market share and margins at their competitor’s expense.”*

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Jim Brown, President, Tech-Clarity

Travis Waddel shares how the use of technology has helped WTB. *“Our sales and product configurator reduced our quoting and design time significantly. We are now able to quickly enter order details and generate quotes and drawings, making turnaround much more efficient.”*

When selecting that technology, it should support several key areas. The remainder of this document will examine those areas.

Ensure Quote Accuracy

A successful quote is much more than just responding quickly. It has to be accurate too. The challenge is that quotes have a very small sweet spot. A low quote is competitive so the chances of winning the bid are high. However, if it costs more than you charge, you will lose money or your margins will be so low you'll hurt profitability. This is not really business you want. If the quote is too high, margins will be great, but it won't be competitive and the business will likely be lost. You can't afford to guess. Having more confidence in the predicted cost gives you advantages in the sales cycle. You know how aggressive you can be in the sales cycle and still stay in the black.

The company that is the fastest to respond to a customer, dealer, or distributor request has a significant advantage in winning the order. Time is critical, and expectations for rapid response have increased.

Jim Brown, President, Tech-Clarity

“The company that is the fastest to respond to a customer, dealer, or distributor request has a significant advantage in winning the order. Time is critical, and expectations for rapid response have increased with the growth of web-based shopping,” says Brown from Tech-Clarity. “The response to requests has to be fast, and it must also be accurate. A fast quote followed up by a phone call that says the product can't be produced, or that the quoted price was incorrect can be more damaging than a delayed response. The manufacturer must not only be able to respond quickly, but deliver what they say they will, when they say they will.”

Tech-Clarity's report, [Best Practices for Developing Industrial Equipment](#), shows that the more advanced design and configuration techniques used by Top Performers lead to more accurate quotes. Top Performers report their quote accuracy is within 7%. Meanwhile, their lesser performing competitors report 13% accuracy. This gives Top Performers an extra 6 points to play with in deals.

Integrate to the Enterprise

While automating the sales to manufacturing workflow is extremely valuable, it can be helpful if the configurator can also connect to other enterprise systems such as CRM and ERP. This makes it easier to manage those databases populated with order information and manufacturing information such as inventory levels.

Precision Polymer Engineering (PPE) relies on a web-based order form to support a combination of distributors, agents, and direct sales teams. While they found the

automatic creation of CAD models, drawings, and proposal documentation valuable, the integration with their ERP system has been critical. *“The data sent from the configurator into ERP supports the generation of items, routings and BOM’s as well as the necessary link to the automatically generated PDF drawing,”* says Mick Holland, former Global Product Manager at PPE. As a result of their integrated solution, PPE reduced ERP data set-up on these products by two hours per a component, allowing faster, more effective quoting. *“One Christmas Eve we received a large opportunity that manually would have taken us 56 man hours to quote,”* says Holland. *“Our automation solution allowed quotation within seven to ten minutes.”*

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Mick Holland, former Global Product Manager, PPE

In fact, Holland was so pleased with the solution; he implemented a similar solution of even wider scope at his current company, ERIKS Sealing Technology, where he is the General Manager. *“In addition to the intended use of the CAD configuration software, we also use it to completely manage our business processes for our new product introduction specials,”* says Holland. *“The software manages our workflows and with it, we ensure that we are in compliance with the design requirements for ISO 9001 and meet the needs of our customers who demand custom design solutions, in addition to mass customized designs.”*

Enable Web and Mobile Platforms

Internet technologies have continued to make it easier to reach customers. In many cases, a customer can be empowered to “self-serve” on a website. A Business-to-Consumer (B2C) experience can even be offered to Business-to-Business (B2B) companies. This lowers the cost of sales and creates a value added service for customers, especially those who would prefer to get pricing without dealing with a sales person.

Pine Research Instrumentation develops custom laboratory setups for customers, which often includes custom glassware and custom electrodes. Their sales process used to involve the customer, sales, and engineering. Typically, it would take two to four weeks to get a quote. *“This labor intensive process was very expensive and drove up our costs,”* describes Steve Sagi, Mechanical Engineering at Pine. To improve the situation, they decided to build a website for custom glassware design with real-time 3D visualizations and instant pricing. Sagi explains, *“The goal was for the customer to design it to eliminate the engineering-sales relay that took so much time.”* It is clear the website has proven to be very successful as Sagi continues, *“The customer is presented with an easy to navigate web site to configure the glassware. Our sales configurator with design*



automation at the back end generates a picture and drawings. It then calculates the price and shipping size and also has the intelligence to do error checking.”

The two to four week process was reduced to nearly instantaneous and customers know they are getting exactly what they need.

Steve Sagi, Mechanical Engineering, Pine Research Instrumentation

The website has allowed Pine to deliver a higher level of customer service. “*The two to four week process was reduced to nearly instantaneous and customers know they are getting exactly what they need,*” says Sagi.

Another consideration to support the sales process is using a sales configurator that supports websites that run on any device. The ability to support mobile devices and tablets further extends the ability to reach customers and empowers sales people and distributors. With flexible options, they can meet with customers anywhere.

Keep the Implementation Simple

Implementing an integrated sales and product configurator doesn’t require a long drawn out process. Some companies mistakenly believe they need someone else to set up the configurator for them, but that may not be necessary. The reality is that the rules or tribal knowledge referred to earlier, generally resides within the organization itself. Therefore using internal champions to implement the project can drive success. Mullionz has “conferred their expertise” in the window industry into their configurator and has found their implementation to be very quick. “*After we created our master model in CAD, we implemented our configurator software and in less than three months we had our first production drawings,*” says Ed Page, Chief Engineer at Mullionz.

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Ed Page, Chief Engineer, Mullionz

Specialized skillsets are not required for the implementation either. BW Container Systems was impressed that their software enabled them to automate design customization themselves and without software programming skills. “*We’ve tried many things in the past, like creating a standard library of drawings, custom programming, etcetera. when software like this was not available,*” says Shaji Shereef, Director of Engineering Automation at BW Container Systems. “*Rules-based automation is the best, easy-to-use, scalable solution of them all.*” Their engineers can now spend time on more productive tasks that require an engineer’s skills and knowledge rather than tedious, repetitive tasks.

Make sure you know what your external and internal customers need and want before automating. If you understand what your sales team needs, adoption will be natural for them.

Rob Yule, Director of Engineering, Blue Giant

When starting an implementation, think through the goals. *“One of our first lessons has been to clarify the vision for design automation and where you want to go,”* says Rob Yule Director of Engineering at Blue Giant, a manufacturer of loading dock systems and materials handling equipment. *“Think about what’s needed and keep it simple. Make sure you know what your external and internal customers need and want before automating. If you understand what your sales team needs, adoption will be natural for them.”*

Another important part of the implementation is don’t try to do too much at once. Start small, prove value, and then extend the software. Small, proven successes will also support better adoption as others will want to enjoy the same benefits. This creates a “pull” for the solution rather than “pushing” it onto them. When employees want to use new technology, the company will start enjoying the benefits sooner.

“The knowledge capture process is ongoing, but one of the many benefits of our configurator as a design automation tool is that you do not have to have all of your crazy rules and reasons sorted out before you can start working,” says Blue Giant’s Yule. *“With our tool, adding new rules and changes as you go is very simple so it was easy to expand and build off of our initial efforts.”* Yule goes on to explain how the implementation was managed at Blue Giant. *“Major components and assemblies were broken into smaller, easier to manage projects. This made the automation process easier to control overall, easier to define in terms of project scope, and easier to understand the detail needed at a given level,”* explains Yule. With this approach, over a three year period, Blue Giant has generated 23,000 quotes and produced 60,000 custom drawings through their software solution. They now have 100 dealers using it globally. One of the driving factors has been that they took what used to be one to two days for a quote down to two minutes. Yule concludes, *“The investments for design automation have definitely been worth it!”*

The investments for design automation have definitely been worth it!

Rob Yule, Director of Engineering, Blue Giant

Conclusion

Today’s competitive environment is forcing many companies to look for new ways to stand out from their competition. For many, engineering products to order to meet customer needs can provide this advantage. For others, customization is already so

prevalent in the industry, they must find a way to offer Engineer to Order products as easily as if they were offered in a standard catalogue. Regardless of the reasons for offering ETO products, customization drives up complexity, which can add to the risk, cost, and time to deliver products to customers.

In our case, the software has aided us exponentially, our order conversion rate is higher than manual quoting methods and we've increased our order rate by approximately 90%.

Gary Shackelford, Vice President at Heat & Sensor Technology

With an integrated sales and product configurator, companies can manage complexity with a more efficient and economical customization process. This can provide such a competitive advantage that many companies find both revenue and profitability have gone up. *"We believe universally, our sales and product configurator saves time for both the consumer and the manufacturer,"* Gary Shackelford, Vice President at Heat & Sensor Technology. *"In our case, the software has aided us exponentially, our order conversion rate is higher than manual quoting methods, and we've increased our order rate by approximately 90%."*

By integrating the sales, engineering, and manufacturing processes, customer information captured during the sales process can drive and automate all deliverables including quotes, engineering details, CAD models, and manufacturing information. *"The configurators allow our customers to select, build, visualize, examine and confirm their selected heater components before they place their order,"* explains Shackelford. Having all this information available so quickly during the quoting phase provides a competitive advantage. *"Immediately, our customers see how we beat competitor quotes in terms of speed and value,"* adds Shackelford.

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Gary Shackelford, Vice President at Heat & Sensor Technology

Ultimately, Successfully using configurators to improve profitability in ETO is about delivering a better experience to customers. Companies who are easy to work with and keep their commitments are more likely to win business. Shackelford concludes, *"Our online product configurators are a benchmark of achievement – representing the excellence in customer service that we're continuing to develop."*

Recommendations

Based on industry experience and research for this report, Tech-Clarity offers the following recommendations:

- Understand the cost drivers of custom products
- Ensure quotes are both fast and accurate
- Use guided selling to simplify the buying process and ensure that all required information is accurately and consistently collected for every order
- Automate manufacturability checks during the sales process
- Use the information entered in the sales order to drive design information such as CAD models, drawings, and manufacturing instructions
- Automate sales, design, and manufacturing deliverables with a sales and product configurator
- Take advantage of internet technologies and support multiple devices to extend your reach to customers and dealers
- Keep in mind implementing a sales and product configurator does not need to be overly complicated and should be easy to maintain and improve
- Integrate configurators with other enterprise systems such as ERP and CRM to maintain a single source of enterprise information
- Use productivity gains from configurators to improve customer satisfaction and increase revenue opportunities to boost profitability

About the Author

Michelle Boucher is the Vice President of Research for Engineering Software for research firm Tech-Clarity. Michelle has spent over 20 years in various roles in engineering, marketing, management, and as an analyst. She has broad experience with topics such as product design, simulation, systems engineering, mechatronics, embedded systems, PCB design, improving product performance, process improvement, and mass customization. She graduated magna cum laude with an MBA from Babson College and earned a BS in Mechanical Engineering, with distinction, from Worcester Polytechnic Institute.

Michelle began her career holding various roles as a mechanical engineer at Pratt & Whitney and KONA (now Synventive Molding Solutions). She then spent over 10 years at PTC, a leading MCAD and PLM solution provider. While at PTC, she developed a deep understanding of end user needs through roles in technical support, management, and product marketing. She worked in technical marketing at Moldflow Corporation (acquired by Autodesk), the market leader in injection molding simulation. Here she was instrumental in developing product positioning and go-to-market messages. Michelle then joined Aberdeen Group and covered product innovation, product development, and

engineering processes, eventually running the Product Innovation and Engineering practice.

Michelle is an experienced researcher and author. She has benchmarked over 7000 product development professionals and published over 90 reports on product development best practices. She focuses on helping companies manage the complexity of today's products, markets, design environments, and value chains to achieve higher profitability.