

*propel*

The Ultimate Guide to  
**Making Custom-Engineered Products**





As the world's technological challenges grow more complex, so must the products that meet those challenges. Custom-engineered products fill previously unmet needs and therefore require a high level of collaboration and information management to control the process from conception to delivery to the customer.

Teams that are able to deliver custom-engineered products on tight timelines and delight customers have an undeniable advantage in the market.

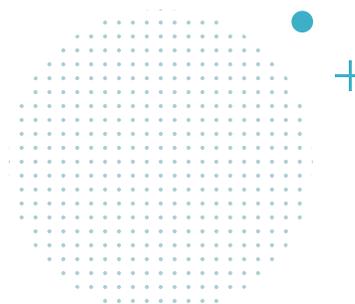
In a 2020 survey conducted by Tech-Clarity, more than 200 companies reported the custom engineering challenges they're seeing and how top-performing companies set themselves apart. In findings, 44 percent of respondents said that custom-engineered products helped improve their sales margins, and 50 percent of respondents also reported higher sales volumes. However, less than a quarter of respondents were considered high performers based on a series of performance measures that contribute to their profitability.

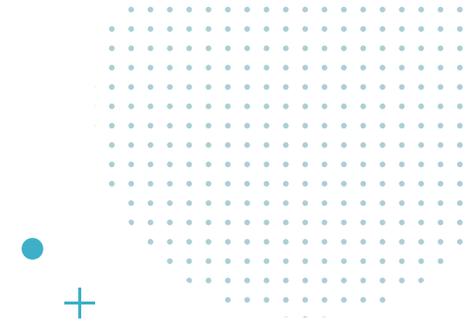


These top performers who are able to match quality and cost control with the speed the market demands are more than twice as likely to have integrated processes to create custom-engineered products, and twice as likely to report that collaboration is "very easy."

These results don't just naturally occur — they're the result of an organization's ability to align their teams and enhance collaboration across the entire team.

In this guide, you'll learn about what defines a custom-engineered product (and what doesn't), understand the components, benefits and challenges of aligning your sales and engineering teams, and get practical next steps for establishing or optimizing your custom-engineered product development practices.





# Table of Contents

<b>Defining Custom-Engineered Products</b>	<b>4</b>
<hr/>	
<ul style="list-style-type: none"><li>• How custom-engineered products are made</li><li>• Examples of custom-engineered products</li><li>• Benefits and challenges of custom-engineered products</li></ul>	
<b>Sales and Engineering Alignment</b>	<b>8</b>
<hr/>	
<ul style="list-style-type: none"><li>• Defining sales and engineering alignment</li><li>• Components of successful sales and engineering alignment</li><li>• Steps toward alignment</li><li>• How sales should work with engineers</li><li>• How engineering should work with sales</li></ul>	
<b>How to Make Great Custom-Engineered Products</b>	<b>14</b>
<hr/>	
<b>Next Steps Toward Custom-Engineered Product Success</b>	<b>15</b>
<hr/>	





# Defining Custom-Engineered Products

Custom-engineered products are variable products that require additional customization to meet customer needs, usually identified in an initial proposal or in the order fulfillment process. Manufacturers often refer to their custom-engineered products as engineer-to-order (ETO) products.

Products that are engineered to order provide a special service the customer quite literally would not be able to find elsewhere. Their unique value (and the opportunity for continuous improvement) makes them a satisfying challenge for the problem-solvers who deliver them well.

## How custom-engineered products are made

High-performing ETO companies tightly integrate their people and processes, which helps them overcome organizational disconnects and improve collaboration to deliver high quality on a deadline.

Manufacturing custom-engineered solutions is a team sport. Sales, engineers, purchasing, operations and finance must all work in close collaboration to ensure the product meets exact specifications on the customer's timeline. The more the team understands and captures initial customer expectations, then meets those expectations, the more successful an engineer-to-order company will be.

A typical ETO workflow, pictured here, presents a potential for miscommunication, with many siloed systems, spreadsheets, emails and manual processes between each step.

## Production Timeline



It's crucial for the sales, operations and engineering teams to work together to identify product specifications, costs and schedules before beginning production, to reduce and be better equipped to handle the inevitable curveballs during the production process.

# Defining Custom-Engineered Products

## 'Engineered to order' versus "Configured to order'

The manufacturing industry has almost as many terms to describe custom products — such as engineered products or tailored products — as they have actual custom products, along with nuanced terms to describe the different methods for creating custom products.



Configured-to-order products require less input from engineering and operations, and are:

- Usually modified off of a mass-produced base product to meet customer requirements
- Easily quoted due to low cross-team involvement
- Ruled by a standard pricing process

Custom-engineered products require a more involved cross-team process, having:

- More complex and unique specifications that cannot be met via configuration
- No set pricing expectations due to the complexity of the product

## Examples of custom-engineered products

High-tech, contract, semiconductor, tier 1 auto, specialty chemicals, and industrial manufacturing are some of the fastest growing engineer-to-order categories, but custom engineering can cover a broad range of industries, such as:

- Mattress and upholstery fabrics
- Meat grinding and processing machinery
- Thermal management solutions for technology
- 3D sensing and imaging equipment

Custom-engineered products allow you to give customers exactly what they need, when they need it, and at a price they can afford. When you offer this level of end to end service, you can ensure that you stand out from other manufacturers.

Here are four great examples of what's possible when you offer engineer-to-order products the right way. They also show how this production method can help you diversify your customer base and increase customer retention.

**Aluminum Precision Products** manufactures custom-engineered aluminum and titanium products, producing everything from strong lightweight parts for the automotive industry to titanium implants for the medical industry. A few configure-to-order products, such as forged wheel blanks, compliment these engineer-to-order products. This diverse portfolio of clients and production styles allows for stability that might not be feasible if the company only served a single industry.

# Defining Custom-Engineered Products

**GlobeTek** designs and manufactures power supplies, chargers, batteries, cables and power cords. They moved into ETO manufacturing when their customers noted that they didn't have a supplier for internationally certified power supplies. GlobeTek's decision to open their own factory is a direct result of listening to their customers and providing them with effective and efficient solutions.

**Pioneer Circuits** designs, manufactures, and tests printed circuit boards in fields such as deep space technology, satellites, avionics and missile defense – all niche markets, but in a wide range. Their highest-profile customer, NASA, has sent some of their circuit boards to Mars!

**Siemon Interconnect Solutions** designs and manufactures a wide range of cables, cabinets, racks and power distribution units. In order to meet the needs of their customers, they do everything from research and development to on-demand manufacturing in-house. This kind of end-to-end service isn't just good for business, it's also great for the customer, since it ensures that they're fully involved in every step of the process.

These four companies show the diversity of engineer-to-order products, which aren't limited to certain product types or tied to any one industry. ETO products also foster growth, provide stability, and allow you to stand out in a crowded marketplace.



# Defining Custom-Engineered Products



## Benefits and challenges of custom-engineered products

### Why make custom-engineered products?

High-functioning ETO companies with great cross-departmental collaboration can compete for market share and generate high profits other companies simply can't touch due to their ability to respond to customers quickly under high pressure and deliver complexity on a deadline.

Complete alignment on proposals and quotes between sales, operations and engineering is only possible when those teams are able to access all needed information on one platform to create a single source of product truth and collaborate in real time. With that single source of truth, profitable custom products can get into customers' hands faster and propel companies ahead of their competition.

### Challenges to making custom-engineered products successfully

The two biggest challenges ETO companies must address early and often are first, customer churn, and second, low margins. The two issues intertwine: A bad customer experience with poor communication plus unexpected changes can slow down the design process or alter cost estimates.

These twin dangers pose a threat to legacy ETO companies with siloed teams, whose market share is being chipped away by nimbler startups who can collaborate with more agility on customer requirements, product updates, schedules and costing estimates.

Poor product collaboration does more than hurt a company's bottom line. Low-functioning ETO companies often suffer from employee turnover due to last minute requests and frequent overtime. When custom-engineered products are made inefficiently using chaotic or antiquated processes, it wears on morale and bandwidth, along with creating a poor customer experience.



# Sales and Engineering Alignment

Manufacturing companies who make custom-engineered products know that engineering and sales teams need to work together well for ETO products to be successful – but at most organizations, these two teams rarely get along, hampered by a lack of visibility into the other’s work. Sales and engineering alignment heals this divide between the two teams.

Like sales and marketing alignment, harmony between engineers and salespeople is not only possible with the right platforms and mindset, but also a business imperative for companies that make custom-engineered products.

## Defining sales and engineering alignment

Sales and engineering alignment is the maintained state of continuous cross-team coordination of all data points necessary to sell and produce a custom-engineered product. This can include project objectives, component costs, customer requirements, and any other details during the process of defining, designing, selling and producing engineered products.



### Signs of successful alignment

- Working collaboratively from the beginning of the quoting process
- Constant two-way communication, especially when changes are requested
- Total customer transparency and satisfaction from concept to delivery; great customer experience
- Production levels from engineers matches sales’ pace of winning deals and moving along opportunities (one team isn’t slowing down the other)
- Creating, managing and sharing detailed product information on the same cloud platform
- Syncing product data across all sales channels

### Sales engineering vs. Sales and engineering alignment

Note that sales and engineering alignment is not the same as sales engineering. Sales engineers are specific roles within B2B sales teams who sell technically complex products. You may find sales engineers in helpful roles that “sit” between their sales teams, marketing teams and product development teams, which assist in alignment, but often get shuttled back and forth between sales and engineers and can be the recipient of a lot of yelling and stress.

Alignment isn’t one role’s job – the responsibility lies with the entire sales and engineering organization as a whole.



# Sales and Engineering Alignment

## The importance of sales and engineering alignment

Misalignment in custom-engineered product manufacturing companies can damage the top and bottom line, resulting in lower new product revenue, lost business, a decrease in revenue, lower product margins, and unhappy customers.

Poorly-aligned ETO companies may experience these pain points:

- More lost deals (decrease in win/loss percentage) because sales, engineering and operations waste a lot of time and can't coordinate a response as fast as competitors
- Lower customer satisfaction (fewer/smaller orders per customer, more customer support complaints) because they've lost confidence in the company's ability to deliver
- Decreasing project margins because of poorly coordinated quotes across sales, engineering, purchasing and finance team leaders
- More delayed projects (or missed customer commitments) because of a lack of visibility across all projects and roadmaps
- Too many or too few projects because members of the team lack visibility into overall pipeline and existing projects and work styles

The ultimate goal engineers and salespeople share is the same: Both want to respond to sales inquiries faster, differentiate from the competition, create products that are truly innovative, achieve more precision in each quote, and prevent lost engineering time by developing quotes with more

speed — all without last-minute adjustments adding up and making the deal less profitable.

The faster sales can respond to customers, and the faster engineers can work off of correct specifications, the more accurately the two teams can collaborate, reducing costs, saving time, and keeping customers happy. After all, customization is a profitable business, which offers a special service the customer quite literally would not be able to find elsewhere. Alignment empowers ETO companies to deliver consistently on that unique value.

## Components of successful sales and engineering alignment

### Aligned KPIs

It's hard to stay focused on delivery goals when your two teams are measured by different key performance indicators. How could they possibly be aligned when they answer to different authorities? Shared KPIs create a shared feedback loop for both teams. Without it, they speak two different languages and data points can get lost in translation.

Align your sales and engineering teams with twin sets of metrics that work in harmony with each other and reflect your values and goals. Measuring speed from two standpoints, for instance — time to close (Sales) and build and queue times (Engineering) — can provide a helpful set of metrics for ensuring customers are being served quickly and identify roadblocks for both teams.

# Sales and Engineering Alignment

## Correct quotes

It seems simple, but ask any ETO salesperson or engineer and they'll tell you different cautionary tales of customers who keep adding on requirements every week or salespeople over-promising specs to customers and handing off double the original budgeted work to their engineers. Quote accuracy is crucial for preventing stacking costs with every change and feature request down the road.

Sales and engineering quote alignment comes down to clear communication. Make sure your teams can confirm the answers to these questions before taking on your next ETO client:

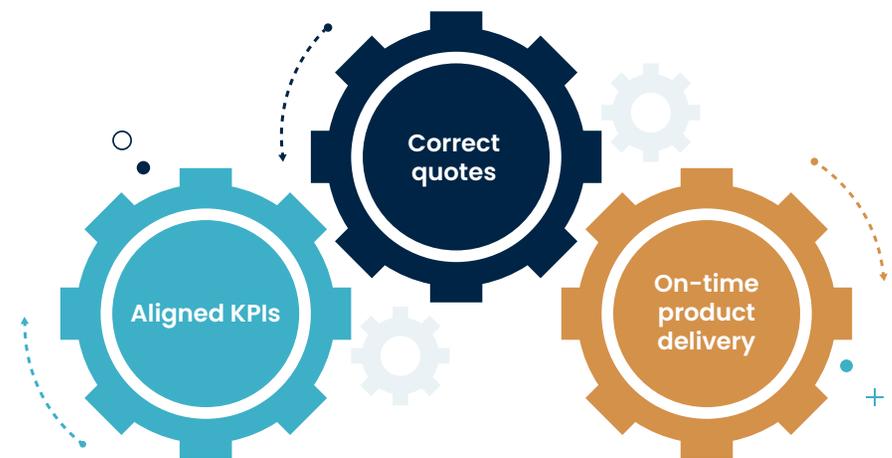
- Is sales able to quote accurately, knowing the actual value of different product features?
- Can engineering and operations provide accurate schedules for production?
- Is engineering fully aware of all of the customer's technical requirements at every point of the product lifecycle?
- Can engineering access sales process activity in real time, and vice versa?
- Has sales done their due diligence confirming customer needs before handing off the project to engineers?
- Is sales able to submit features requests to engineering in a timely manner, and can engineering review them quickly?

Clarity is key. Taking the time to deliver an accurate quote will save costs down the road and save your team from a lot of headaches.

## On-time product delivery

ETO companies can often end up in a tangled fulfillment timeline that gets weighed down by last-minute feature requests. Teams can choose between attempting to fulfill the order within the initial schedule, or upsetting a customer by extending that schedule.

The urgency of added requirements within the initial timeline creates an unhealthy workload for the whole team, generating more risk: Job insecurity and workplace stress can cause turnover, burnout, illness, absenteeism, and can even jeopardize safety in operating machinery. However, moving a delivery date further down the timeline to avoid burning out your team can upset customers or even risk losing their business if their schedule is firm. Custom-engineered product companies should prevent this dilemma earlier by ensuring alignment.



# Sales and Engineering Alignment

## Steps toward alignment

To achieve sales and engineering alignment, ETO companies must get their two most personality- and workflow-opposite teams to function in total harmony with each other while selling and manufacturing products that have never existed before — sounds easy! — and it actually may be more attainable than you might think.

**Look at the data you already have.** Your last few deals have left breadcrumbs behind. Ask your HR team to pull an hours report for both teams to look at overtime. Who is burning the midnight oil? On which accounts and project types? With which salespeople? How's the conversion rate and churn on high time-investment deals? Locate the burnout and overwork on your team and note it.

**Build empathy.** Visibility is great, but do your salespeople and engineers know what to do with it? Set up a recurring rotation for engineers to listen in on initial sales calls. Salespeople should receive basic training for factory floor safety and be familiar with your manufacturing and design processes. Plan your next quarterly goal-setting meeting to include both teams in the same room.

**Unite on the same platform.** If your PLM and CRM live in different places and don't talk to each other, you simply won't be able to achieve full alignment. ETO business changes fast. Sales and engineering need to be able to pull up product and customer records with to-the-second accuracy and communicate using a shared source of truth. Does your current system support two-way, constant, clear communication? If not, your largest barrier to true alignment will be your systems.



# Sales and Engineering Alignment

## How sales should work with engineers

The sales team is on the front line, and it's their job to convince potential customers that the company can meet their needs. However, their desire to close a deal can lead to a less-than-perfect customer experience if what they promise is out of scope with the capabilities of engineering teams. It's critical that sales teams evolve how they communicate and collaborate with engineering teams – beyond merely relying on sales engineers to do the go-between work for them.

## Take the time to create the right roadmap

To quote accurately, sales may need to take more time, since it requires due diligence to guarantee that the proposed project is feasible for the quoted amount and sales process time frame. The best way for sales to achieve this is to actively discuss the proposed deal with operations and engineering. It's an act of balancing speed and accuracy, but it greatly improves the customer experience. This saves time over the long run, which can reduce costs and positively impact your profits.

## Set expectations for product features and requests

It's important for your sales reps to have a basic understanding of what your engineering team can do. This reduces the likelihood that they'll overpromise when making a sale and helps them set realistic expectations with new customers. Setting those realistic expectations greatly contributes to building trust with the customer – and someone who trusts your company is more likely to become a repeat customer.

## Don't work in isolation

When teams do operate in isolation, they don't consult or consider each other when making decisions which can result in a poor work environment, wasted time and lost profits. Sales should understand how the engineering team works and who can help if they have questions, and engineering should know the same information for sales. When you remove that sense of separation and isolation, you create an opening for positive interactions and collaboration.





# Sales and Engineering Alignment

## How engineering should work with sales

It may seem like sales and engineering departments have vastly different workflows. In reality, there are steps toward effective teamwork that engineers and engineering leads can take to make working relationships with sales – as well as maintaining control of projects – much easier.

### **Improve team collaboration by uniting around a common goal**

In order for custom-engineered products to be profitable, engineers have to understand that sales is constantly under pressure from customers. Incorrect quotes create more work for engineers, which wastes their time. Wasted time means wasted resources, and that can make producing custom-engineered products more costly than it should be. An effective team that's aligned is able to focus their collaborative efforts on a common goal of reducing silos and serving customers faster.

## Learn the sales workflow

Respondents to the Tech-Clarity survey said most of their engineering customization happens during the customer inquiry or quote stage of the process. That means that engineering decisions are often made before that team ever touches a project. Because of this, engineers should have at least a basic understanding of their company's sales cycle. When engineers know what sales success looks like, they can better collaborate and ensure that the engineering team's capabilities are considered before projects reach them.

### **Set firm boundaries around roadmap timelines**

The ability to set healthy boundaries is a part of any good working relationship. The relationship between engineering and sales isn't any different. When engineers understand the experiences of salespeople, know their processes, and utilize integrated systems, the outcome is increased visibility and more trust. This results in better, more frequent team communication, which can be leveraged to set firm boundaries around engineering timelines. Those timelines mean that deadlines won't sneak up on either team, and they help to maintain focus on delivering great products to customers.



# How to make great custom-engineered products

In order to deliver successful new products to happy customers, companies that do custom product development need to create low-cost products by helping customers, engineers and others find and edit similar products, while streamlining product development, eliminating errors and improving product quality.

The thought of building an ecosystem where all of this happens seamlessly may be overwhelming. In reality, any company can develop new product ideas and deliver great custom-engineered products by starting with these key steps.

## Streamline a simple customer experience

The first step in delivering ETO products is making the entire customer experience as simple as possible. Companies should make finding a potential product fit really easy, but this is often overlooked. A potential customer should be able to browse a company's product portfolio and see if they make products that will fit their needs.

Can prospective customers easily search for products on your website? Once customers find a potential product match, how easy is it for them to submit a custom development request or contact a company representative for early, rapid prototyping?

## Set-up the right infrastructure to deliver great products

Sometimes making custom product development easier for the customer is difficult. Technology limitations hinder legacy on-premises tools and some cloud technologies. It's important that customers and partners are able to easily access a common platform.

## Smooth out new product rollouts

Keeping all partners up to date on the latest product specs, timelines and procedures is critical for success. If product rollouts break down in the field, nothing else matters. Most companies focus on supply chain and distribution, but they forget other stakeholders like installers and field service partners. Both should be trained and ready to deal with potential product issues during every phase of a rollout.





# Next Steps Toward Custom-Engineered Product Success

Removing teams from their departmental vacuum, providing clarity around engineering capabilities, and making sure quotes are correct are all important steps in improving the alignment of your teams. It's difficult to succeed at these steps if there's a breakdown in your collaboration and communication process.

There are a number of ways for teams to communicate and collaborate, which is often the root of the problem: companies often use more than one service for communication and find this method doesn't work well due to the high-touch nature of their operations. Using multiple services means that there's no one place for everyone to view all of the relevant information.

Using a shared platform helps to ensure that your teams are able to successfully take the steps above and communicate in an efficient manner. Better communication, coupled with team alignment, can result in happier customers, happier employees and better profits.

## Connecting the product and customer record

Companies seeking to begin or improve their custom-engineered production processes should start by connecting their customer record to their product record on a cloud platform every stakeholder can access, so that there aren't disparate workflows or conflicting sources of truth that slow down delivery and block companies from winning new business.

According to Tech-Clarity, top-performing companies have engineering teams that are well-connected with the product commercialization process. They're 2.5 times more likely to have integrated processes for design and go to market preparation, which likely contributes to the speed of their new product development and introduction process. Top performers are also 79 percent more likely to have integrated data and processes for supporting engineering change management.

## Deliver custom-engineered products to market faster

Bringing engineering and sales together as a united, effective team is critical for custom-engineering companies. It can be a difficult team building process, but it's not impossible.

In fact, there's a way to integrate team communication and improve cross-team collaboration while winning up to 15 percent more deals and reducing project delays by 40 percent.

Learn more about how Propel helps custom-engineered product companies work better as functional teams by viewing a demo of our solution here:

[propelplm.com/solutions/use-case/custom-engineered-products](https://propelplm.com/solutions/use-case/custom-engineered-products)