



The Six Key Questions
OEMs Need to Ask
Before Choosing an
Electronics Partner



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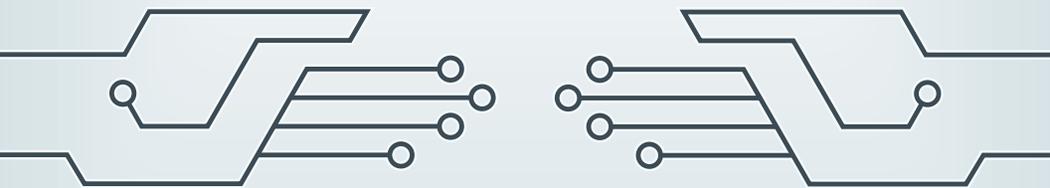
This handbook is designed to provide insight into six key questions to help you make that decision. In it, we discuss the pitfalls you may encounter, as well as the dos and don'ts of finding the best partner for your company.

The six questions are:

1. How important is vertical expertise?
2. What do you need to ask the potential partner about standards?
3. How much engineering support will you need?
4. What do you need to consider when deciding whether to go offshore or onshore?
5. What do you need to know about your partner's sourcing of materials?
6. How can you turn your partnership with the right EMS into the competitive edge you need to succeed?

But before we begin considering these questions, let's consider the basics.

If you have plans to go to market with a new electronic product, you are probably considering how to choose the right electronic manufacturing services (EMS) partner to design, engineer, and/or manufacture that product. Admittedly, it can be a formidable prospect; selecting the right partner requires careful evaluation and every choice you make will have many implications.



Laying the Groundwork: Basic Questions

Before you start your search for the appropriate EMS, you will want to ask yourself the following questions:

- A.** How far along are you in the process? Do you already have a prototype?
 - B.** How many pieces do you think you will need to manufacture?
 - C.** Where will your product be sold?
 - D.** How much design and engineering support do you need?
- A.** Exactly where are you in the process of developing your electronic product? Are you just beginning development or do you already have a product prototype? Taking your product's development status, as well your internal capabilities, into account, will directly influence your selection of the right partner. Your partner needs will vary depending on whether you require a build-to-print, or someone who can assist you in the development and design for manufacturability.
- B.** You will also need to estimate your anticipated annual volume. If you know your volume will be limited to, for example, 100 pieces annually, you will probably want to avoid larger manufacturers. Because these firms will consider your manufacturing run to be negligible, they will likely relegate you to secondary importance, reserving their efforts and staff to service clients with significantly larger volumes. The price point they are able to offer you may be enticing, but inevitably, you won't receive the support that you need.
- C.** Also consider where the end product will be sold, whether in North America, Europe, Asia, or some global combination. Depending on the complexity of the product and how it's manufactured, it might make more sense to produce it in the continent where it will eventually be sold. The total landed cost may be the same (or even less) if manufacturing is in relative proximity to the point of sale, as opposed to the long lead times required by shipping across country, or continent. You also need to account for travel to your supplier in the total landed cost. You will need to visit your partner on a regular basis to review their progress, their adherence to your quality standards, etc.
- D.** Finally, how much support will you need as a customer? Have you got an extensive internal support network, including engineering and program management support? Do you plan to be involved in the selection of materials? If not, do you have an internal purchasing group to run that for you or would you prefer to rely heavily on the selected partner? This question comes down to evaluating the size and capability of your internal resources. The partner you select should blend well with your own capabilities or fill any gaps.
- Many of these questions will be referenced again below. Knowing the answers to these fairly basic, yet critical, questions from the outset will help you prepare for more the complex issues you will

1

How Important Is Vertical Expertise?

One of the first questions you need to ask is the relative importance of your potential manufacturer/partner's experience in your specific market. Surprisingly, it may not be as important as you might think.

That said, if your product is intended to fill a need in a niche market, such as the medical industry, your partner obviously needs the appropriate certifications to manufacture products for that market. In the case of the medical industry, that certification is ISO 13485. This means that if you're a medical company looking for a partner, you should immediately eliminate anyone who can't deliver on ISO 13485.

If, however, you are not working in a niche market with specific certifications, it is advisable to select someone with a wide diversity of experience. It does not follow that if you are developing a new cell phone, you want to work with a supplier who only manufactures cell phones, because then their experience would be narrowly limited to that specific area of technology. Instead, you want a partner with proven expertise in producing extremely simple products at one end of the spectrum, to very complex products at the other, including through-hole and surface-mount technologies. This gives your partner the ability to provide the service you need, while bringing to bear cross-pollination expertise from other projects they have worked on. When you select a partner who is involved in production for a wide range of markets, you can leverage technologies being used in markets different from your own.

In summary:

- How important is it for your partner to have specific vertical experience?
 - It can be very important, particularly in niche industries
 - Look at vertical certifications, e.g. ISO 13485 or TS16949
- But sometimes cross-pollination is more advantageous
 - Some technologies can be applied broadly across verticals
- Is the organization diversified enough to deliver new-to-market ideas?
 - Working with multiple verticals provides great insight and opportunities

For example, the automotive industry tends to work on the leading edge of many technologies. By working with a supplier who is familiar with this industry, you may be provided opportunities to be exposed to technologies developed for that environment and apply them to your own. This will help you bring products to market that give you a competitive edge over your competitors.

2

What about Standards?

Working with a partner with diverse industry expertise does not mean that you should disregard certifications and standards altogether. In fact, taking on a partner that lacks qualified certifications may prove to be a recipe for disaster. Showing some form of ISO certification indicates that the supplier follows a defined process. You want to make sure that this process is uniformly implemented throughout their facility and that they don't limit their adherence to only certain products. By ensuring that this process is applied on all products, you can be assured of a highly reliable, quality component.

Even if industry certifications are not a requirement for your particular product, market certifications may be. Such market certifications include Canadian Standards Association (CSA), or Underwriters Labs (UL). It's important to realize that if your product is approved to these certifications, representatives from these agencies are apt to appear unannounced at your supplier-partner's facility to perform an audit that ensures that your product adheres to their standards.

If you select a partner who is not experienced in dealing with these agencies, and who might choose to deviate from the approval in either process or components, you may hit a serious roadblock as a result of an audit. In the direst of circumstances, the investigators may call a halt to production, preventing you from getting your product to market.

However, a partner who is familiar with these agencies knows the steps they have to navigate when these auditors appear randomly. You need a partner who has the experience and knowledge to dispute or negotiate if a problem crops up. Your supplier should, at the very least, know how to negotiate with the investigator to obtain continuity of supply until the issue is resolved. Ideally, you are looking for a partner with the internal expertise to bring you solutions rather than presenting you with problems.

In summary:

- Which standards does your market require?
- How do you find a partner that can meet those standards?
 - Limiting factor: for certain industries, partners require certain certifications
 - Your customers may require that certain business practices are followed
 - If you're in this type of industry, resources like ThomasNet can be helpful in identifying partners who meet specific criteria
- Don't let certification stand alone
 - You still need to meet and evaluate all potential partners carefully, and ensure business practices are being followed

But don't let certification be the only way to ensure that your product is developed using a quality process. You still need to meet with potential partners to make certain that they follow best practices, even if your product isn't subject to either industry or market regulations. Lacking these, you want to make sure that specific industry standards, such as IPC—an industry standard for manufacturing electronic products—are adhered to. Does your potential partner train their production workers to IPC standards? How often do they undergo training and how often are they tested to ensure that they're performing to standard?

3

How Much Engineering Support Will You Need?

One of the basic questions you needed to answer above was: where are you in the development process? We are referring back to this because you need to assess how much engineering support you will need – and that may change based on your current status. If your product is still in the concept stage – neither engineered nor designed – or even if it is somewhat designed, can your chosen partner supply the kind of support you need?

You may need only design for manufacturability (DFM) or you might want to hire a supplier with the engineering capabilities to take your original idea all the way from concept through to a final product. If the latter is true, you are looking for a company with total turnkey capabilities. In which case, you need to know if they have qualified engineers on staff, both from a design and manufacturing perspective.

Even if you plan to do much of the design and engineering in-house, it's essential that you address the product's DFM early in the process. Engineering a product and engineering a product for repeatable production are two very different kinds of engineering. A successful product launch requires that both types of engineering be considered, taking scalability into account, and provided your engineering team understands the importance of total transparency in working with the supplier's team.

In summary:

- Engineering a product and engineering a product for repeatable production are two very different kinds of engineering
- Tying these two engineering types together is what facilitates a successful product launch
- Scalability of engineering is critical
- You must combine your engineering capabilities with those of your partner – ensuring compatibility and comfort level of both engineering teams

If your internal engineering group is delivering the design work but you plan to outsource the manufacturing of the product, it's best to select your supplier as early on in the process as possible and involve them in your plans at every stage. This helps ensure that DFM is included from the outset and prevents you costly redesigns just prior to product production. For example, there may be aspects of surface-mount technology that need to be addressed early in the process to avoid both manufacturing and field issues. So it is crucial to allow sufficient time and effort upfront from a manufacturability standpoint.



4

Offshore? Onshore? Which Is Right for You?

Should you manufacture your product offshore or would it be better to build and manufacture locally? This is a significant consideration and requires a thorough investigation of several factors to arrive at the right answer for your company and product. Some of these questions could be:

- Where will the end market be?
- How much manual assembly is required?
- What is the current exchange rate?
- What will transportation cost?
- What type of lead times will you need?
- What is the supply chain off shore?
- How often are you prepared to travel overseas to ensure that your chosen supplier is adhering to your specifications?

In response to this last question, we recommend that you be on site at least every two to three months, and that you appoint a dependable local delegate who can check up even more often.

If you choose to go off shore and have to change your engineering design, it is important to realize that you will have somewhere between eight and twenty weeks of material in the pipeline that you still must absorb or scrap. If your manufacturer is local, you will lower that lead time significantly and therefore minimize your exposure. To mitigate the potential issues of working offshore, you might consider finding a supplier-partner who has both onshore and offshore facilities. This gives you the leeway to work locally at first, taking advantage of the partner's proximity. Then, as your volume ramps up and you become confident in the stability of your design, you can work with your partner to move production offshore. A number of suppliers can assist you locally with engineering and manufacturing but also have the capability of captivating the manufacturing in the offshore environment.

In summary:

- How mature is your design? Will there be changes?
- What's the volume?
- How much lead time is required?
- Geographical considerations
 - Where will you sell your end product?
 - Where will you complete manufacturing?
- Cost sensitivity?
 - Unit price vs. total cost

The advantages of working offshore is, of course, the potential cost-savings. However, determining the nature of your product is important as you evaluate if those cost factors are truly advantageous. Highly labour intensive manufacturing is generally better suited off shore. But products subject to heavily automated, surface-mount production are often better served in local facilities. When you consider the speed of the equipment and the production quality in North America, your total cost of procurement is probably the same or less if you choose to stay local. If you're selling products in Asia, however, then of course it makes more sense to produce them in Asia.

The key isn't simply the assessment of unit cost: it's the total cost of procurement. That means calculating the sum of all factors that affect your final costs.

5

The Question of Sourcing

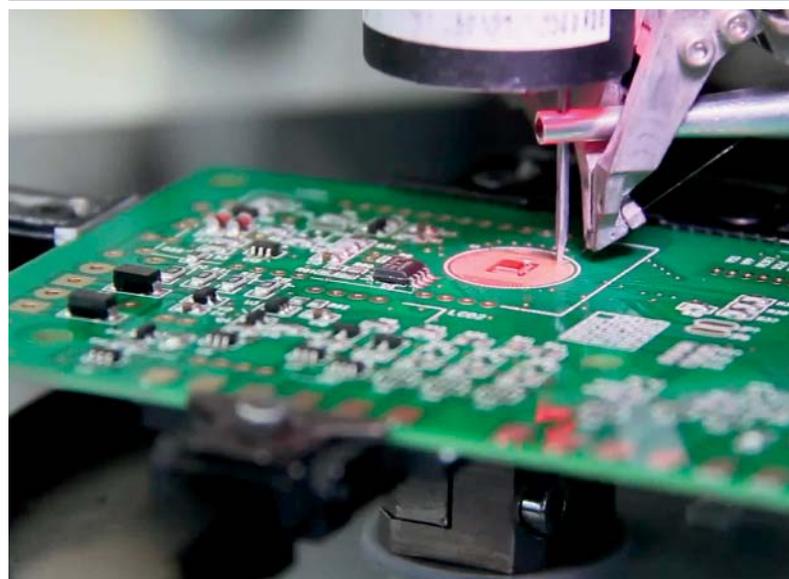
A potential pitfall of working offshore is the question of sourcing. Will your supplier adhere to your specifications religiously? What can you do to ensure that they do? It's not unusual for offshore suppliers to substitute inferior grade or lesser quality components or materials for those originally specified. If they do, these substitutions may cause field failures or problems once in the market. So if you do manufacture offshore, make sure that you rigorously monitor the components or materials are being used to construct your product on a regular basis.

One way to do this is to ask your supplier for documentation. Will they provide a certificate of compliance or test reports that clearly indicate that your product is being produced per the original specifications? Are they prepared to share their approved vendor's list? If they are already working with reputable companies, that is a good indicator that they will not deviate in sourcing. While they may not be willing to provide the cost of billed materials or identify what they themselves are paying for them, they should still consent to sharing applicable part numbers, the supplier they're buying from, as well as any alternates that they may buy, and which process controls are in place.



In summary:

- Do you know where your parts are coming from?
- What standards must be upheld with your product?
- Are potential partners working with reputable companies?
- Are potential partners carefully auditing sources?
- What level of traceability are they willing to share?



6

A Good Partner Gives You a Competitive Edge

Having satisfied yourself that you are making the right decision in regards to your partner selection, you might still want to ask a few other questions. If you're selling into a particular marketplace, does your EMS partner sell to your competition? While you may not worry about this from the outset, you certainly will want to know if there is any possibility that they might take your product, modify it, and then sell it to your competition. While this may be a difficult concern to broach, and while you may not be looking for complete exclusivity, you certainly want to have some level of confidence that your partner will not share your product with competitors.

Another smart question to ask yourself at this stage: is the need for your highly customized product actually sufficient to go through the process of designing, engineering, and manufacturing? Consider the price tag for delivering to market a mere thousand pieces a year, which can cost you between \$50 to and \$100 thousand. Can you really afford that investment or would it be more cost effective to work with an already existing, off-the-shelf solution, possibly with some modifications?

And does your chosen partner have the capability of growing along with you? Stories abound in which products first hit the market and were only slated to sell five thousand units per year. Yet these products so quickly captured the market that the demand grew to 150–250 thousand annual units. While clearly the mark of success, such sudden demand can create growing pains. So you want to know from the outset:

In summary:

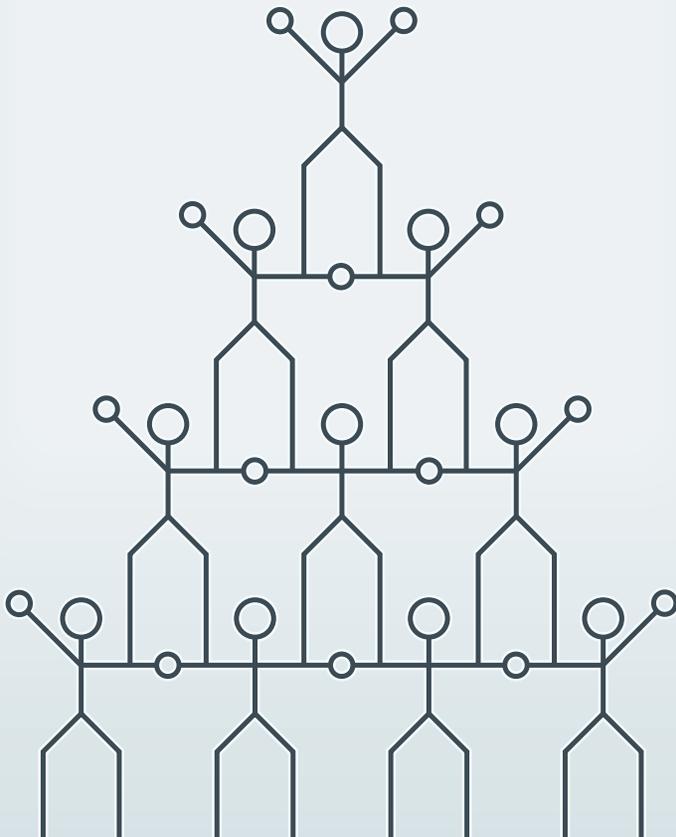
- Does your partner sell to your competition?
- Does everyone in the market rely on the same solution for electronics/electronic controls?
- Is your specific marketplace large enough to sustain customized product?
- Do you have a partner you can trust to grow with you and help create an innovative product line?
- Does the potential partner have enough experience in your market? And will the experience of your partner's other markets benefit the development of your product?

- Can your particular supplier/partner scale to answer a sudden surge in demand?
- Have you determined what their capacity is when you first engaged them?
- Are they prepared to invest in additional capital equipment to help support your growth?
- Do they have the capability of doing so?
- Do they have the facilities, the knowledge, and the ability to hire and engage experienced personnel that can grow along with your product line?

The last thing you want is not to be able to manufacture your product in sufficient quantity to respond to market demands. But if your partner can scale along with you, they will be poised to provide you with the competitive edge you need to succeed.

Ask the Right Questions, Find the Right Partner

The process of finding the right EMS partner can seem daunting at first. But by working through the issues outlined in this handbook, and by recognizing potential pitfalls as well as opportunities, you should be well equipped to locate the right partner for your particular product and business.



About Etratech

Etratech Inc. is a privately held corporation specializing in the design, development and manufacture of advanced electronic controls and control systems for major multinational companies. We serve original equipment manufacturers (OEMs) and other manufacturing firms with a total solution that extends far beyond traditional electronic manufacturing services (EMS). Our specialty is in microcontroller-based products.

Founded in 1989, Etratech employs more than 400 people worldwide. Our 50,000 square-foot facility in Burlington, ON houses complete product development, electronic engineering, automated production and value-added services under one roof. We also own and operate a 48,000 square-foot facility in Shenzhen PRC under the banner Etratech Asia-Pacific Limited, which specializes in turnkey design and manufacture of high-volume electronic controls and control systems for many international OEM's. Learn more at www.Etratech.com.





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