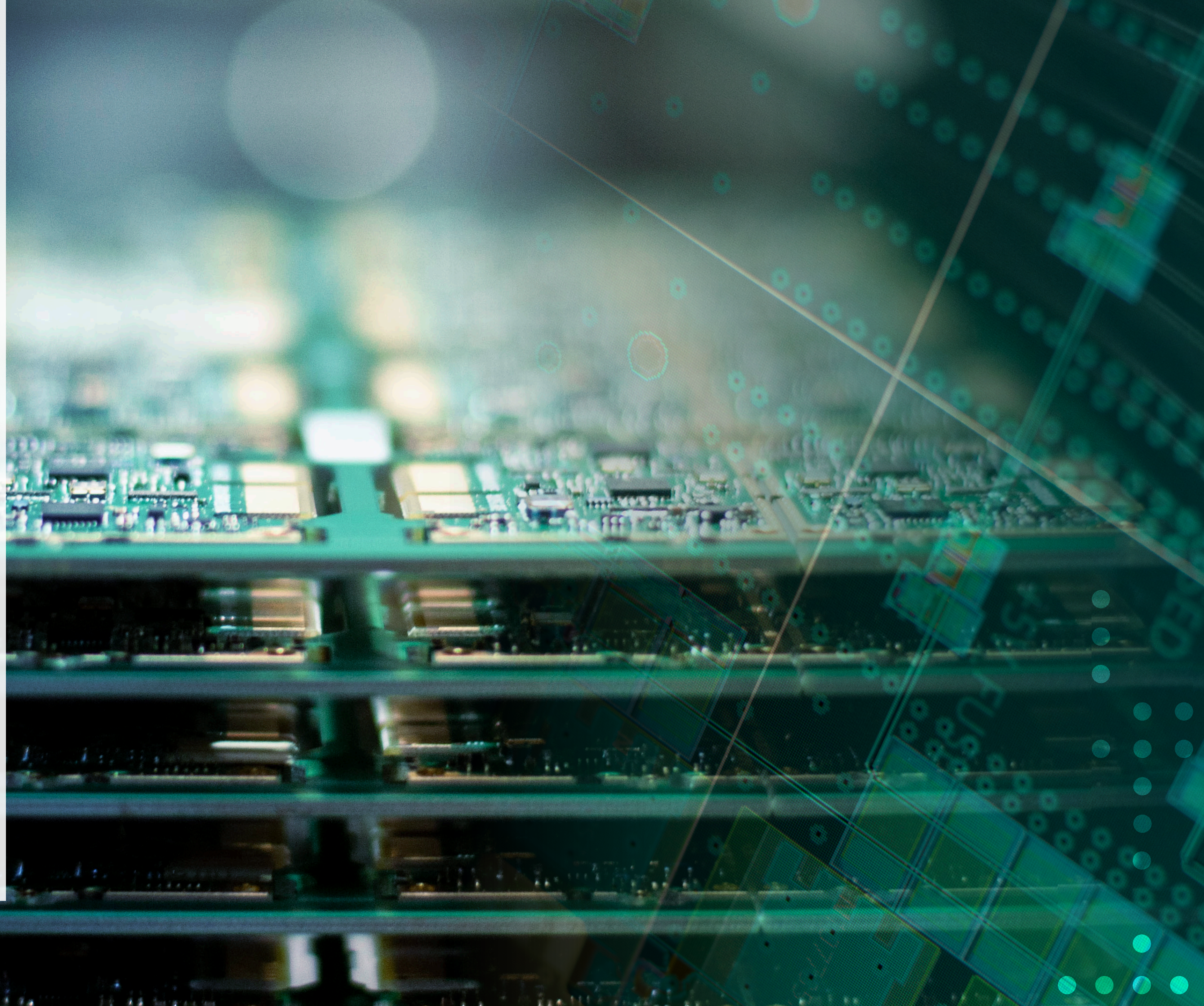




6 don'ts in outsourcing electronics manufacturing

How you can take your relationship
with EMS to the next level



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Introduction

Why it's essential to start from the don'ts

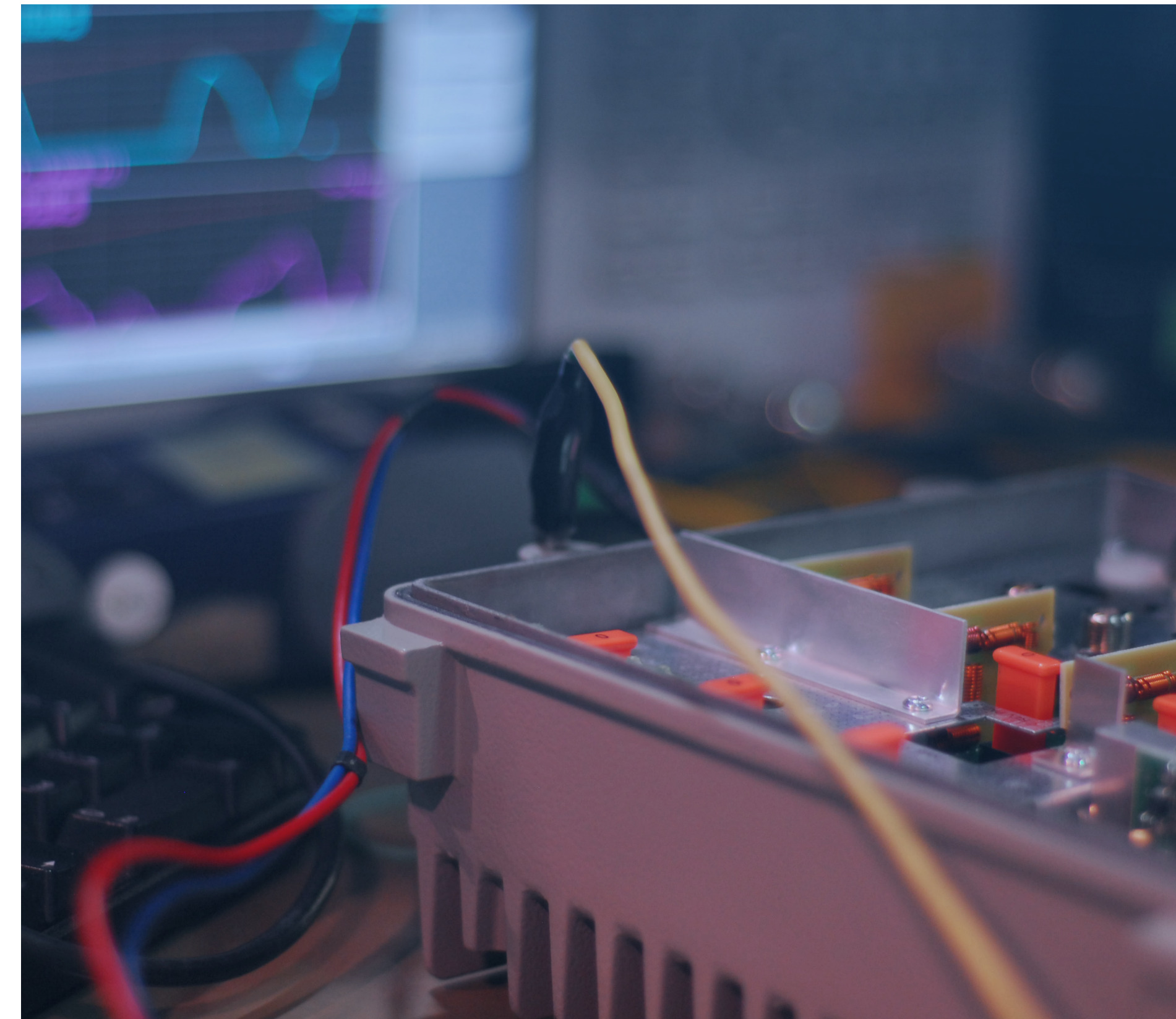
Technology is evolving right before our eyes, requiring an increasingly flexible approach from the producers of electronic devices, challenging them to remain competitive and to ensure a quick time to market. As a result, the marketplace of outsourcing electronics manufacturing services by high-technology enterprises is growing by the minute.

Those companies expect nurturing in various activities: from product development and contract manufacturing to after-sales services such as product certification.

Although outsourcing is a common practice, finding an EMS partner that is easy to do business with is challenging. Not to mention knowing what's worth considering in searching for such a gem: transparent communication, technical expertise and a reliable supply chain management process. The shape and functionality of the electronic device can evolve on the fly during the product development process. Thus, you expect to have a partner that can handle all of the turbulent variables that may occur. With this in mind, you should seek a flexible EMS company that is ready to go the extra mile for you – the one that takes care of everything in the broad scope of manufacturing while you focus on your core business.

But how do you find the perfect match with an EMS company? You identify the red flags first, and if burdensome, you should start to explore

other options. To that end, we gathered the top 6 Don'ts in electronics manufacturing based on the knowledge we have gained over the years being on both sides of the table: as an OEM, and as an EMS provider. Above all, it's always advantageous to acknowledge the strengths and threats in order to identify and manage the risk.



In this ultimate guide,
you'll discover:



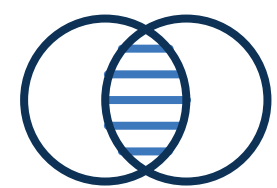
What you can expect
from your potential EMS
provider



Why you should take
the lead in pursuing a
transparent supply chain
strategy



The science of design and
manufacturing under one
roof: what works for your
business



What a reversed timeline
is, and why you need one



Why it's vital to choose
an EMS company that fits
your needs, values and
approach to business



EMS, OEM, CEM and ODM – what do they mean?

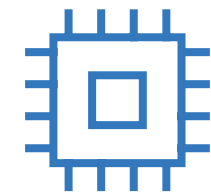
Even for people who work in the electronics industry, some of the abbreviations might be confusing, so let's demystify all of the essential definitions.



OEM

Original Equipment Manufacturer

– is a company that's producing under its own brand.



CEM

Contract Electronics Manufacturer

– offers electronics manufacturing services to the OEM.



EMS

Electronics Manufacturing Services

– provides electronics manufacturing services to the OEM customer. EMS' leading service is printed circuit board assembly (PCBA). Still, over the years, the term EMS has evolved and nowadays is often used interchangeably with CEM, as EMS companies are expanding their range of services to cover everything: from design to logistics.



ODM

Original Design Manufacturer

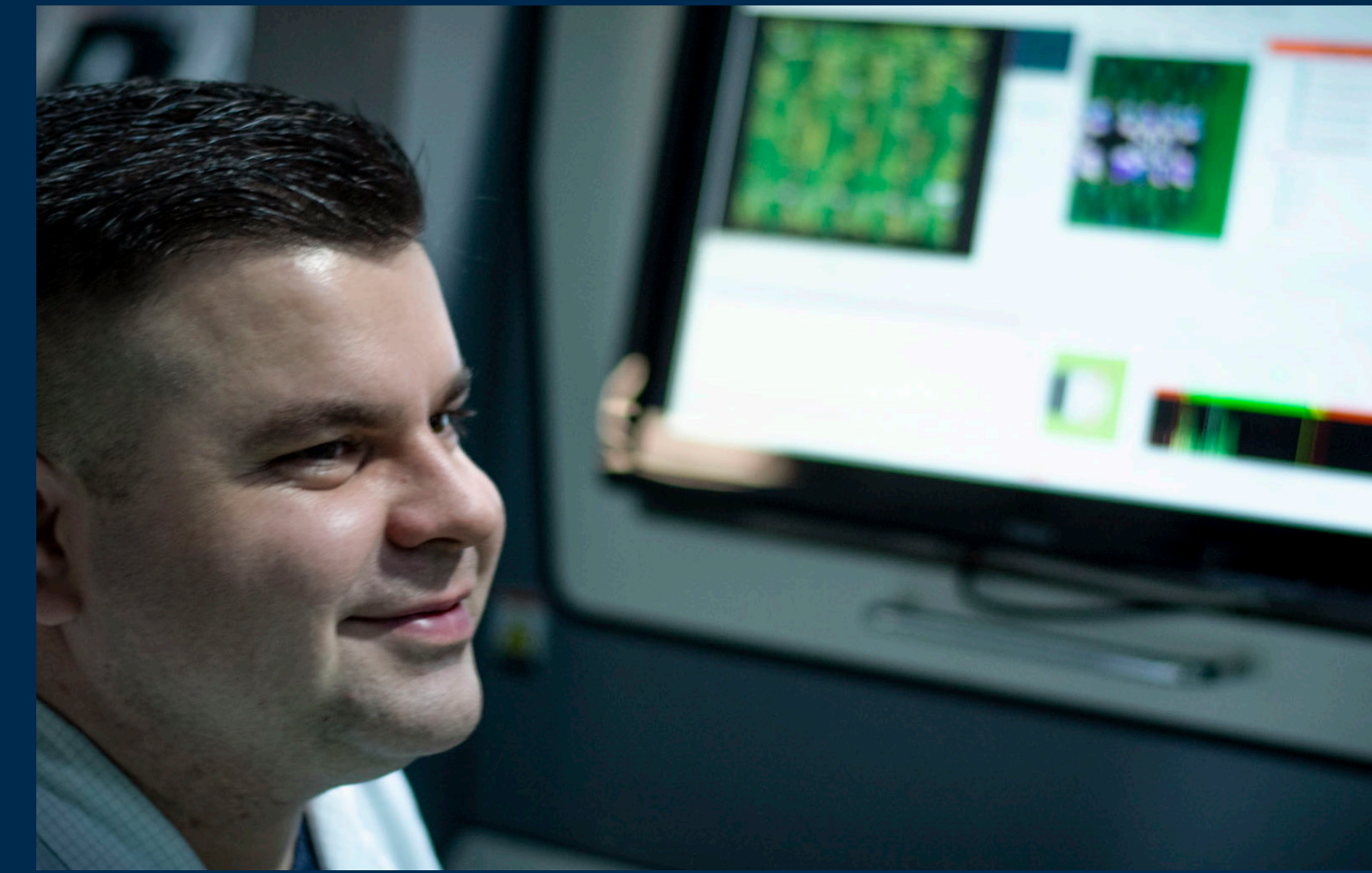
– works similarly to the CEM but develops and usually owns the IP of products.

Summarising:

EMS builds products based on a design owned by the OEM, while an ODM creates products based on its own designs.



6 don'ts in outsourcing electronics manufacturing



**Don't assume that
only a large EMS partner
can perfectly fit your needs.**



Can a large EMS company work on a project in any manufacturing specialisation?

Yes, it probably can.

Does that mean there's no other company on the market that can handle it more intelligently and cost effectively?

Absolutely not!

The electronics industry is a vague term that covers everything from simple sensor modules in the IoT sector to complex telecommunication equipment. Each industry has its own requirements and certification restrictions; thus, responsible and business-aware EMS partners know their strengths. Contract manufacturers often communicate “they can build anything”. Manufacturing businesses face a myriad of complex issues depending on the given technology. As a result, such a phrase can mislead you, considering your potential EMS always has to have its realm in which to excel. EMS specialising in particular industries can remedy the pains you have experienced up to now – in just the same way as visiting a suitable medical specialist for a specific ailment. This effort to bridge the gap between technology and manufacturability is central to smoothly bringing the final product to a mass-market – the desire to unite the idea and the experience in a shared strategy.

If your business is strictly related to telecommunications, you first have to identify the technologies on which you want to base your electronic device: GSM, 3G, 4G, NarrowBand-IoT, you name it. You then need to ask whether your potential partner has the know-how and experience within the manufacturing specifics and particular technology. Ask what challenges you will face. Examine anything you consider valuable to run the NPI process or mass manufacturing.

The first sign of an aware and knowledgeable manufacturing partner is that they'll help you ask the right questions to fit your needs perfectly.

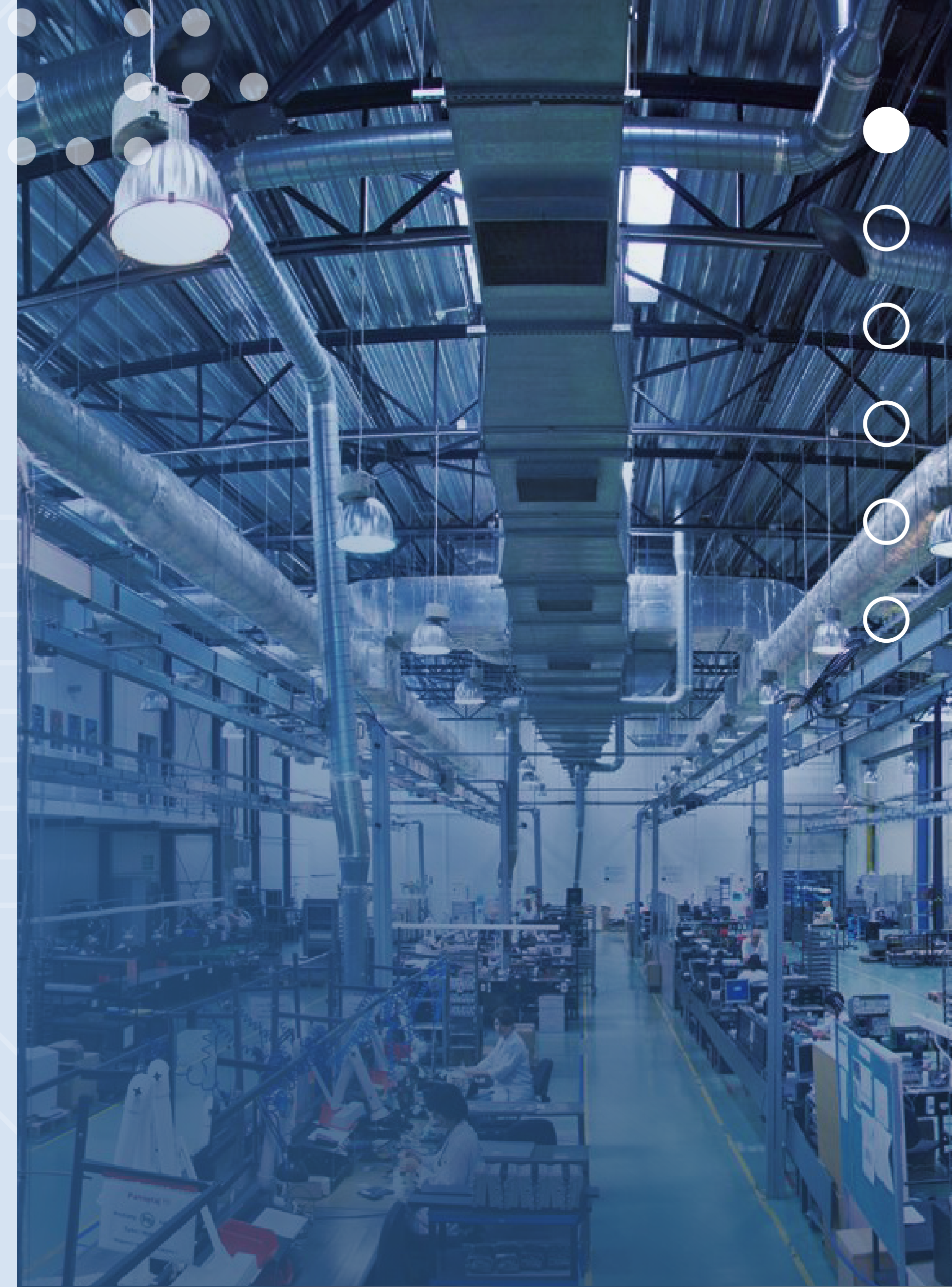
Not surprisingly, some of the top EMS companies attempt to lock in lucrative customers, whereas plenty of medium-sized tech companies are not a good fit from their perspective.

On the other hand, medium-sized companies do not always see the potential to grow with a small EMS by their side. But remember – a committed medium-sized EMS can also speed up the time to market for your product. It's all about their attitude and treating the product with a sense of ownership.

That is, you must find out whether you feel comfortable working with this group of people. Do they keep you informed, and are they always in touch? Do you share the same values, such as taking full responsibility for promises,

and being transparent and honest? If you do thorough research, you will often find a lack of the values that you identify with and need in order to bring your business a sense of stability and security.

Choose an EMS partner with a specialisation that fits your market. Don't hesitate to ask – transparent communication is a necessity, not an optional extra.



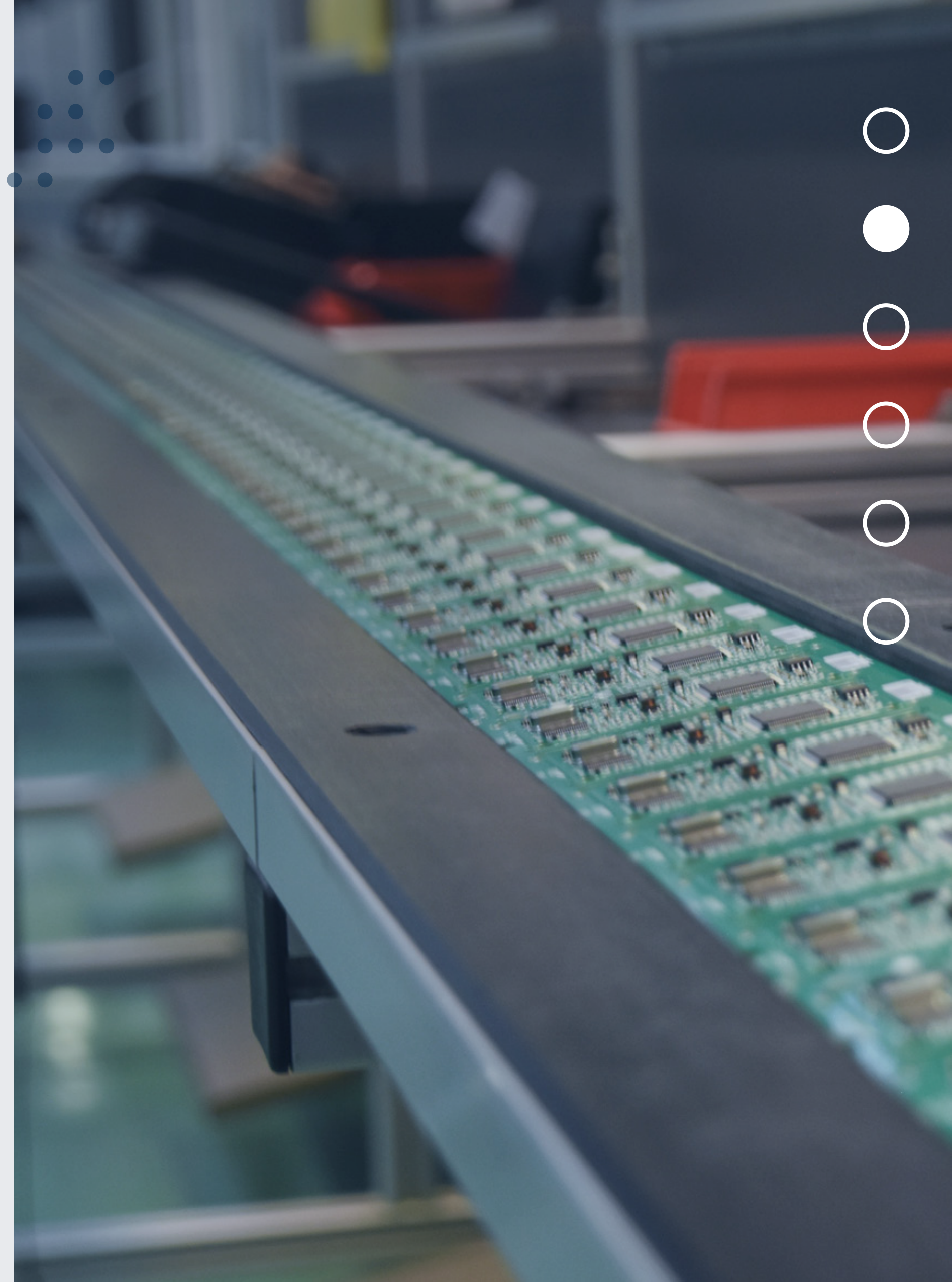
Don't lock in a product launch date first, before consulting it with your EMS partner



The new product introduction process always carries many potential risks. Thus contacting contract manufacturers cannot be last on your checklist when evaluating time to market. The successful concept phase preceding the development stage is crucial because implementing changes withing the design process underway can be expensive and time-consuming. When preparing products for mass manufacturing, things looking perfect on a blueprint often cause bottlenecks in manufacturing.



Ideally, Design For Manufacturing (DFM) consultation should take place early in the design stage, long before the product starts to be manufactured. Therefore, the more you fine tune this phase, the better results you can get in assuring that the design is well-optimised and does not include unnecessary costs. Moreover, a properly executed DFM process involves a team of designers, Printed Circuit Board Assembly (PCBA) engineers, technologists, and sourcing and supply chain representatives. The latter are currently the most desirable for consultation, considering raw materials shortages and component lead times. Staying up-to-date with your EMS partner with an efficient supply chain management process observing deviations, and guiding you into best practices, allows you to easily implement a preventative plan to ensure that deadlines are met. As a result, you will mitigate this risk and identify crucial points in the product's roadmap to gain a competitive advantage.



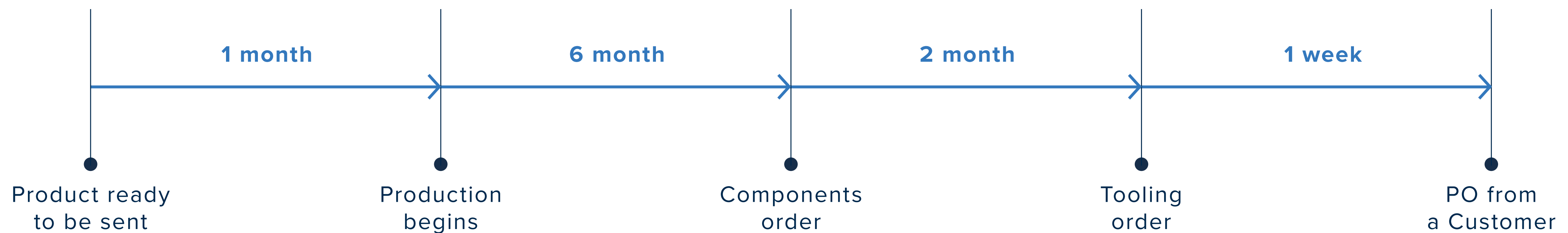
An experienced EMS partner can also serve you with advice on preparing a reversed timeline. You present the proposed product launch date, and in exchange you receive a plan with a reverse chronology. The aim is to point out all of the milestones with realistic time frames, as determined by a manufacturer that is fully aware that the first prototype coming off the assembly

line isn't the last. Counting backwards creates a production timeline that works, the time needed for passing all of the gateways having been taken into account.

Contact your EMS partner at an early stage of the development process, whether it is a DFM or NPI consultation. Only this approach can confirm whether your product roadmap is valid and well secured.



Reversed Timeline Example



Don't delay the business model verification



The business model of your EMS partner should match your preferences. Therefore, it is advisable to interview the EMS company to identify how the team works and determine the range of solutions on offer that you can call on for support.

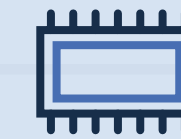
Questions worth to ask:



Is the potential EMS capable of producing the **required product volume**?



Does the EMS partner take care of the **logistics aspect** to deliver your order to any place, e.g. directly to the end customer?



Does the company **work on consigned material**?



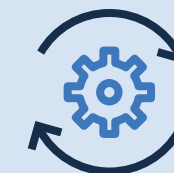
Does the EMS partner have a **sourcing and engineering team** in its organisational structure?



Does the company have enough experience in **design** or/and **manufacturing in your industry**?



Where is the **manufacturing plant located**?



Does the electronic manufacturing company **have the knowledge** and **technical infrastructure** to validate and test your product?



What is the **Minimal Order Quantity (MOQ)** that your EMS partner might be potentially interested in?

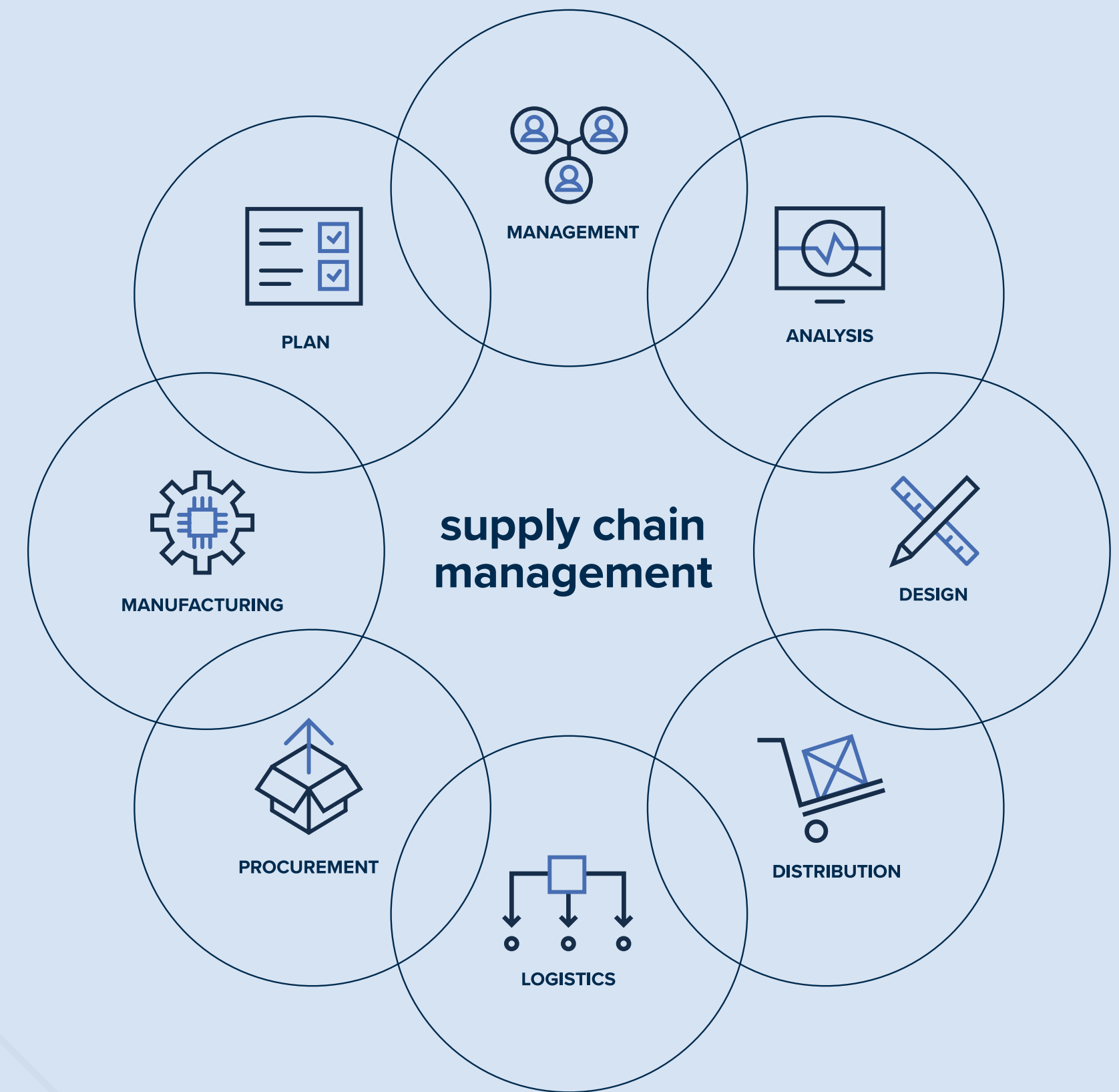


How much is the **total cost** of ownership?

EMS providers are entrusted with managing a wide range of activities, from product design and supply chain management to volume manufacturing, final assembly, testing and logistics. An end-to-end solutions portfolio gives you freedom of choice and a plan B, and opportunities to improve your product after DFM validation or when you need to introduce an Engineering Change Order (ECO). Such a scenario means that the design and production documentation needs to be updated. In such situations, the organisational efficiency of your EMS partner is critical. How quickly they can implement an engineering modification in the product greatly impacts the overall project cost. The change process can be complicated and time-consuming without a savvy partner following the “under one roof” business model with in-house engineering services.

Another thing worth considering is an EMS business model based on an extensive and reliable supply chain management process.

An EMS partner with real-time market data can help you plan and make adjustments by considering your current orders and working on forecasts to prepare for dynamic changes, especially in the highly complex and highly diverse low-volume manufacturing area. The supply chain management process has redefined today’s contract manufacturing. Managing the sourcing and supply chain by your EMS partner includes all of the correlated activities between all partners involved in the entire logistics process, i.e., the manufacturers, suppliers, all of the intermediaries in the company’s various stages of logistics and, finally, the customers. This business model represented by the EMS company helps you understand the importance of the supply chain in outsourcing manufacturing, and perceive it not as a discrete entity but rather as a part of the bigger picture.



The flexible business model your EMS partner represents is crucial to finding the best fusion of Total Cost of Ownership (TCO), time to market and quality.

Don't focus on only one type of service –

design or manufacturing – when choosing
your future business partner



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Today, the most important aspect of Electronic Manufacturing Services is the ability to respond with services that deliver real value to the customer and which invest their money wisely.

As we described in Don't #3 above, keeping electronic design and manufacturing under one roof represents the smart approach, one where you can benefit by being served better, faster and more cost-effectively. Designing and manufacturing are not two completely unrelated processes. When working on a product, you should take care from the beginning to select the most cost-effective components and technologies to be used in the production. Your EMS partner should be able to give you proper feedback on the manufacturability of your

product before starting the entire production process.

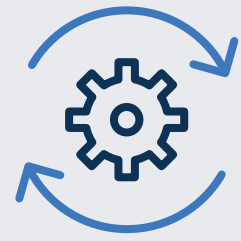
An EMS provider familiar with the Design for Manufacturing and Assembly (DFMA) concept is essential to minimise product cost through design and process improvements. DFMA adds some of the greatest value to make products more profitable. Be aware that the designs you forward to your potential EMS partner should not be locked-down. With no space for improvement and no time buffer for change, the opportunity to take advantage of the mechanics, hardware or embedded software design is lost.

NOTE!

If the manufacturer offers you a free design, be aware that behind this opportunity probably lies an agreement to let the manufacturer keep the intellectual property rights.

Thus, you should be aware of the risk that alongside the product evolution or switching the production to another partner, you will be left with only a locked-down design in which it is hard to implement changes.

Advantages of the hardware design and mass manufacturing under one roof approach:



Easy to manage

You are safe to focus on your core business, while your EMS partner takes good care of everything else.



Manufacturing scalability

If there is a need for larger volumes, you can quickly extend your production capacity.



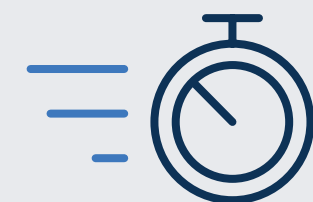
One-stop shop

Your EMS partner supports your product certification because it is essential to ensure that the quality complies with international standards and any safety regulations.



Less capital investment

You don't need to develop your manufacturing or R&D centre, or invest in training and retaining employees.



Quick Time To Market (TTM)

Since selected phases overlap, the design and volume production times are shortened.

An EMS company that has in-house design capabilities can address issues early, especially at New Product Introduction (NPI), before mass manufacturing. As a result, you reduce the time of the whole industrialisation process and optimise the costs.



Don't assume the EMS partner's internal processes and procedures won't influence your business



It's the opposite!

Internal processes and procedures have a massive impact on your product industrialisation.

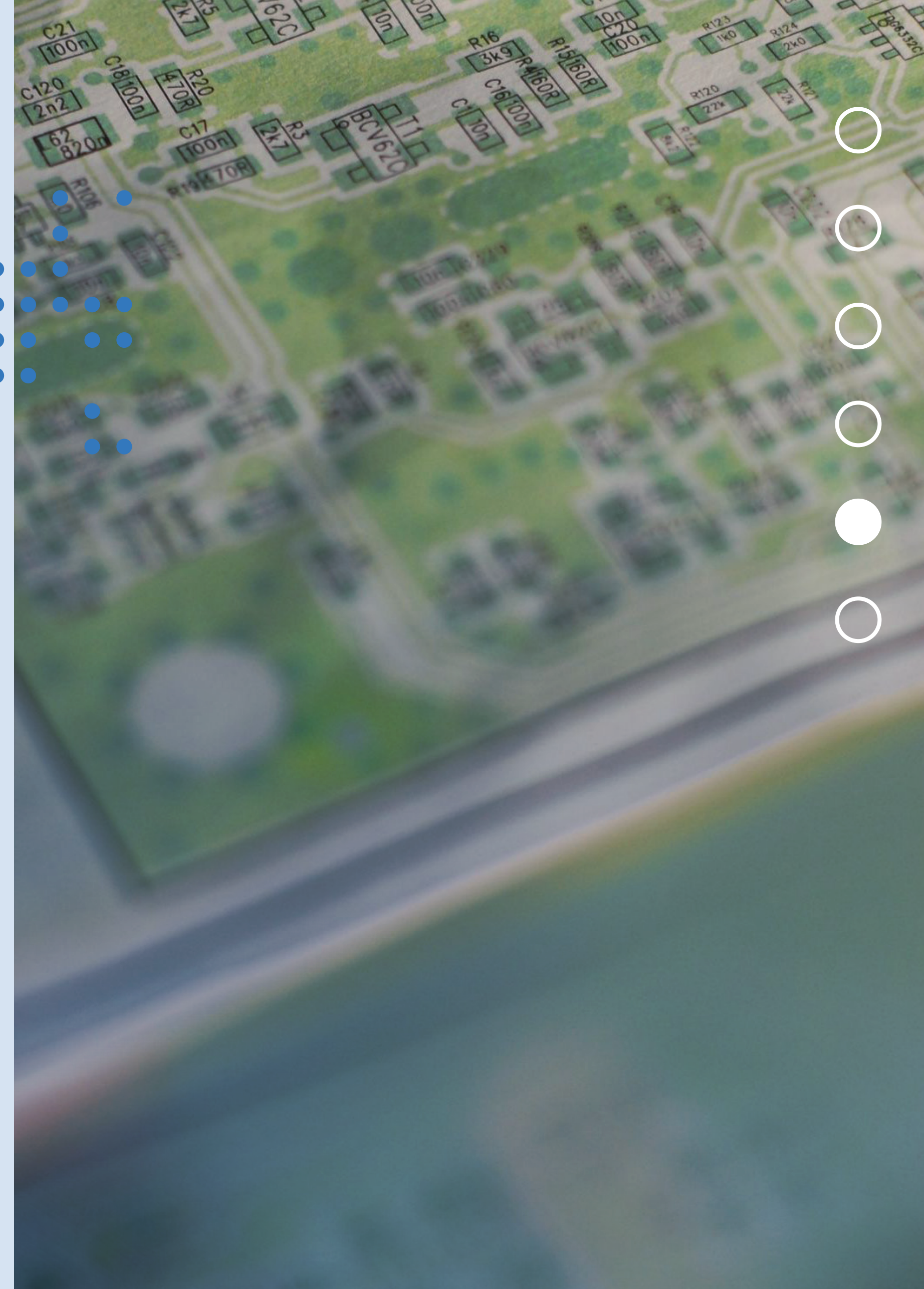
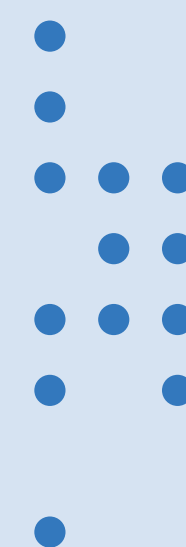
Why? A process works like a map, which uses functions not dissimilar to those of a process. Imagine following a path behind a person who carries the topography in their mind. For some reason, you continue your journey on your own. What now if you were never given the map? You find yourself pretty lost, which doesn't happen if the correct route to

follow is written down — where to turn, to whom to go and where your destination is.

You can move in the right direction. Or, at the very least, you can choose a route you are aware of, rather than merely stumble into the unknown.

The project is monitored and executed according to an agreed schedule with a map.

We can see that our investment is managed effortlessly with such a map for even greater peace of mind.

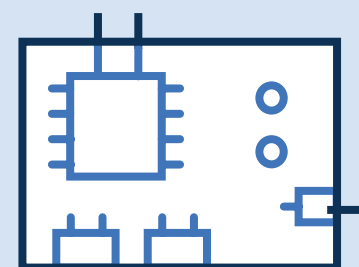


To that end, an EMS company that follows agile processes is the one you need. Coupled with procedures supporting serial production, such as EVT, DVT and PVT, cooperation with such an EMS provider paints a compelling view of spending your money wisely and leaving sluggishness far behind. So, what hides behind these acronyms? Looked at consecutively, they are:



Engineering Validation and Testing

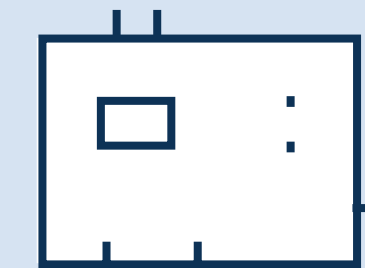
Crucial in checking if all functional requirements match the specification. Typically, it's the first time a contract manufacturer assembles the product using the intended materials. Once the hardware tests provide the results and metrics expected in the specification, the product is ready to enter another gate.



Design Validation and Testing

At this stage, the electronics manufacturer moves closer to validating whether the

components, chassis and other elements form a coherent whole as a tangible product or there is space for improvement; the last call to fix the design. Moreover, engineers prepare the units for regulatory certifications and environmental protections: CE, EC, FCC, UL, RoHS.



Production Validation and Testing

The results of this gate have a decisive influence on the quality and cost of series production. Only minor changes are allowed in the PVT phase. Any significant change to the design triggers a return to the DVT phase. Samples received from the mass manufacturer hold the name of “gold samples”.

Ensure that the EMS company follows all of the necessary standards and procedures, adapts the latest manufacturing technologies, and invests intellectual capital in establishing proven processes. On the other hand, as a partner in business, be responsive and open to suggestions to create an environment to thrive with the help of a savvy manufacturer.

What, knowing this, should you investigate about your potential manufacturer?

What are the questions worth asking?

First and foremost, check if the EMS provider possess the required capabilities to manufacture your product, such as: Surface Mount, Automated Optical Inspection (AOI), Through-Hole, Coating, Box Build Assembly, Cable and Wire Assembly, Testing, Inspection, Packing & Shipping.

Does your potential partner stick to the Design for “X”? Here, the “X” means a mindset

oriented towards specific features, in particular the aim to achieve early consideration of product development issues, addressing both the design objectives and limitations. This leads to an approach where you have vast access to a systematic and cross-functional design methodology.

The design process is oriented towards:

- Design for Manufacturing/Assembly (DFM / DFMA)
- Design for Cost and Design to Cost (DTC)
- Design for Testing/Testability (DFT)
- Design for Maintainability (DFM)
- Design for Robustness (DFR)
- Design for Supply Chain (DFSC)
- Design for Safety (DFS)

Next, verify whether the potential EMS partner understands and implements operational excellence best practices.

The bottom line is that if the company follows a workplace philosophy where problem-solving, teamwork, and leadership result in continuous organisational improvement, it’s probably a partner that will help you grow.

Spend your money wisely when outsourcing by choosing an EMS partner with established processes and procedures. A perfect match learns and develops using and analysing data, and after every turnaround it becomes smarter, more agile and more experienced.



**Don't take EMS transparency
in the supply chain and cost
as only its responsibility**



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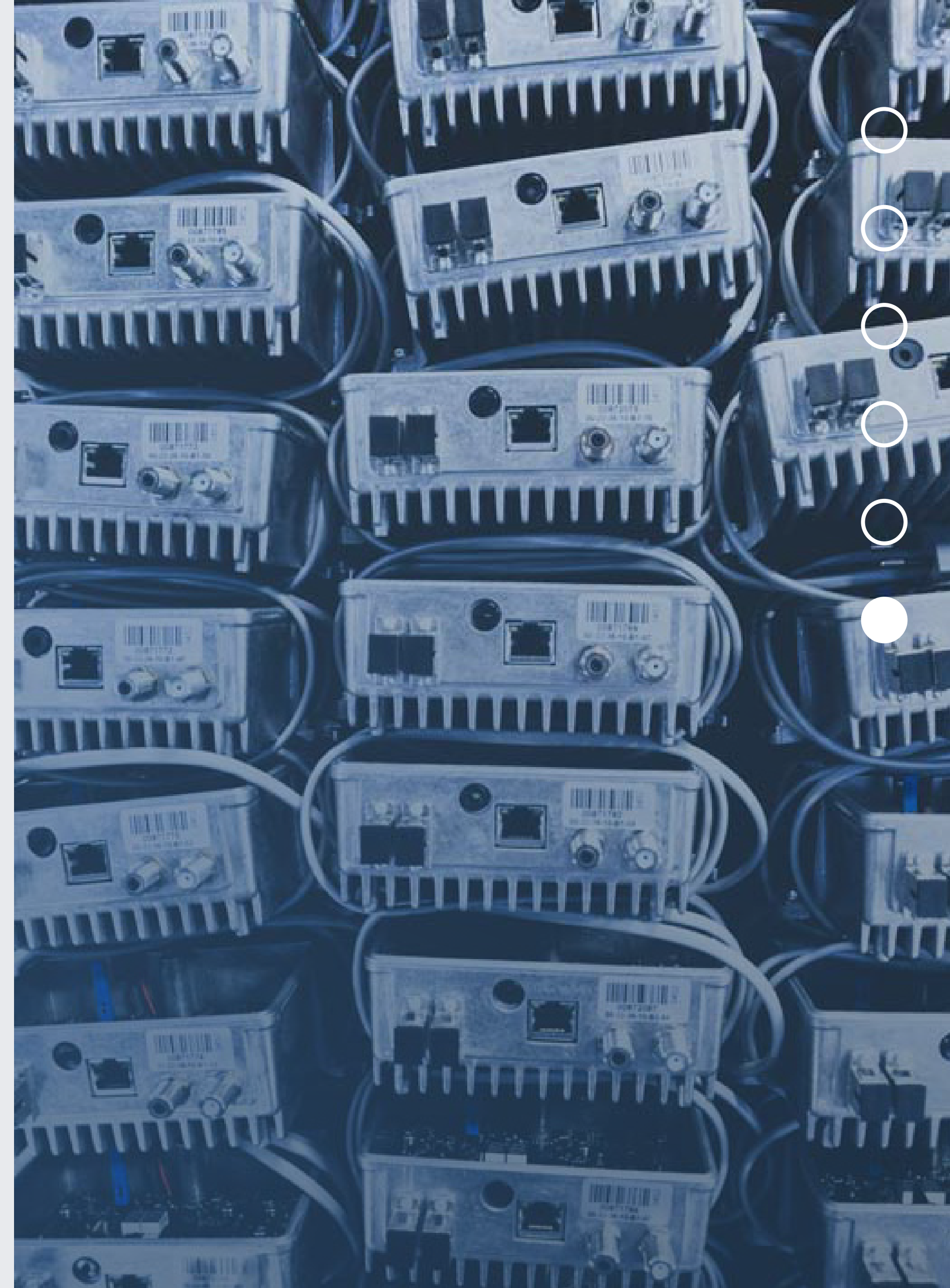
Unexpected situations occurring within global supply chains are inevitable. The key to building a robust supply chain is a plan of how to avoid potential disruptions long before they occur and start to affect your cost and material availability.

A competent EMS partner can ensure the production schedule is kept by firming up forecasts and ordering the most critical parts, those which would increase lead times. Or, based on its broad supplier network, your EMS provider can recommend an alternative supplier in case of limited availability. This is an EMS responsibility. However, the shape of the supply chain architecture depends on more than the savviness of the EMS, as what counts the most is striving for transparency,

as some EMS may mark up material pricing to conceal extra profit.

Ensure that you agree to an incentive scheme that encourages an EMS to work proactively to reduce BOM costs continuously. Typically, this allows the EMS to keep the savings for some period to reward their proactiveness before passing the reduction on to the customer. Again, this would not happen without complete BOM visibility and transparency.

Finally, respond actively to EMS suggestions to improve BOM pricing to a satisfactory and acceptable level to avoid statements like “that’s the way the cookie crumbles”.



Also strive for transparency in the supply chain, especially regarding potential shortages. It is always the sooner the better when it comes to finding alternative ways to resolve any problems. Never rely on guesses or a stroke of luck, and leave no space for communication gaps.

A well-established supply management process embraces sourcing, logistics, the production cycle and sales, operations management, engineering, and even marketing. As a result, the supply chain objectives can focus on the entire organisation's processes, including every stage from the supply of materials to the manufacturing of goods, their distribution and sale. Quick and effective decision-making in supply chain management (SCM)

can be key to ensuring you react flexibly to changing market needs. It is vital to require any EMS partner to continuously monitor the market situation, to stay up-to-date and react immediately when lead times change or supplies are disrupted.

Do not take EMS transparency for granted. Be proactive, because the best BOM costs always emerge from a commitment to customer-specific pricing and product design ownership combined with EMS purchasing power and transparency.



Summary

In this short-form article, we aimed to share the most significant hurdles that await all companies deciding to seek a new partner for design and manufacturing services. We hope the content in this ebook has helped you digest the concept of each Don't and deepened your understanding of the relationship with your potential EMS partner.

Here's a brief list of all gathered Don'ts with a short recommendation of what to do instead.

1. Don't assume that only a large EMS partner can perfectly fit your needs.

TIP: Choose an EMS partner with a specialisation that fits your market. Don't hesitate to ask – transparent communication is a necessity, not an optional extra.

2. Don't lock in a product launch date first, before consulting it with your EMS partner

TIP: Contact your EMS partner at an early stage of the development process, whether it's a DFM or NPI consultation. Only this approach can confirm whether your product roadmap is valid and well secured.

3. Don't delay the business model verification

TIP: The flexible business model your EMS partner represents is crucial to finding the best fusion of Total Cost of Ownership (TCO), time to market, and quality.

4. Don't focus on only one type of service – design or manufacturing – when choosing your future business partner

TIP: An EMS company that has in-house design

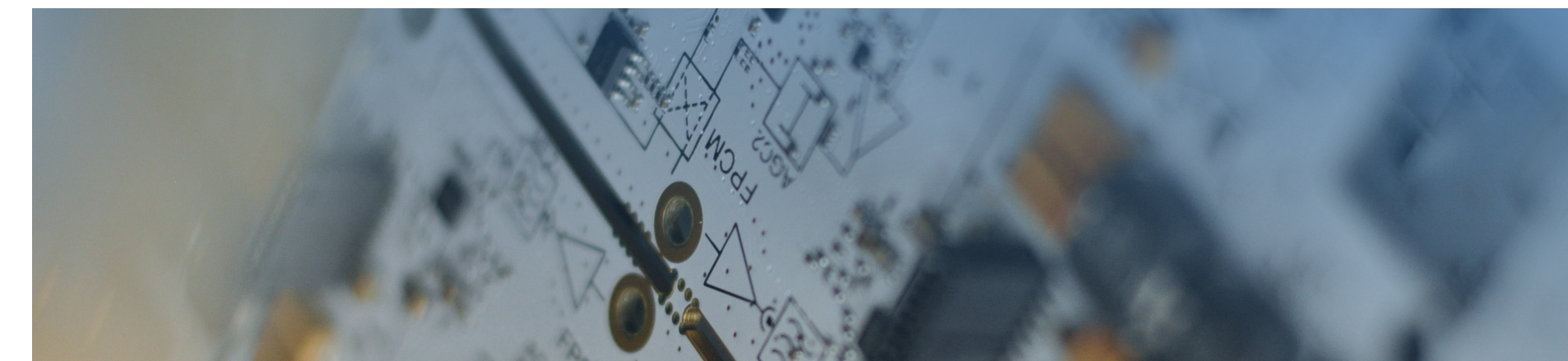
capabilities can address issues early, especially at New Product Introduction (NPI), before mass manufacturing. As a result, you reduce the time of the whole industrialisation process and optimise the costs.

5. Don't assume the EMS partner's internal processes and procedures won't influence your business.

TIP: Spend your money wisely when outsourcing by choosing an EMS partner with established processes and procedures. A perfect match learns and develops by using and analysing data, and after every turnaround it becomes smarter, more agile and more experienced.

6. Don't take EMS transparency in the supply chain and cost as only its responsibility.

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Contact

Contact us at VECTOR BLUE HUB, and our team of experienced, skilled, and reliable experts will be available to get in touch with you. Be among the group of satisfied customers today!



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