

## Four Key Dynamics Driving Effective Outsourcing Decision-Making for Lab Automation OEMs



*Laboratory automation equipment makers need to stay flexible in their outsourcing strategies because their make-versus-buy decision drivers can change over time — a good reason to conduct periodic reviews to validate the continued relevance of their outsourcing decisions.*

## Key consideration behind effective outsourcing decisions: “Know Thyself”

Probably the most famous of the many ancient Greek maxims handed down by the god Apollo is the one carved into the Temple of Delphi more than 2,500 years ago: “Know Thyself.” That’s good advice for today’s OEMs — especially those specializing in lab automation equipment, lab diagnostic equipment, and medical devices — when they’re making critically strategic decisions about how much and what types of work they should outsource to reputable partners.

Why? Because outsourcing decisions, in effect, define not only the many facets of an OEM’s ultimate product but also the OEM itself — its profitability, its balance sheet, and even its organization. In other words, outsourcing creates a particular context within which the OEM will operate. This context will have both strategic and tactical dimensions, including regulatory ones, such as FDA compliance.

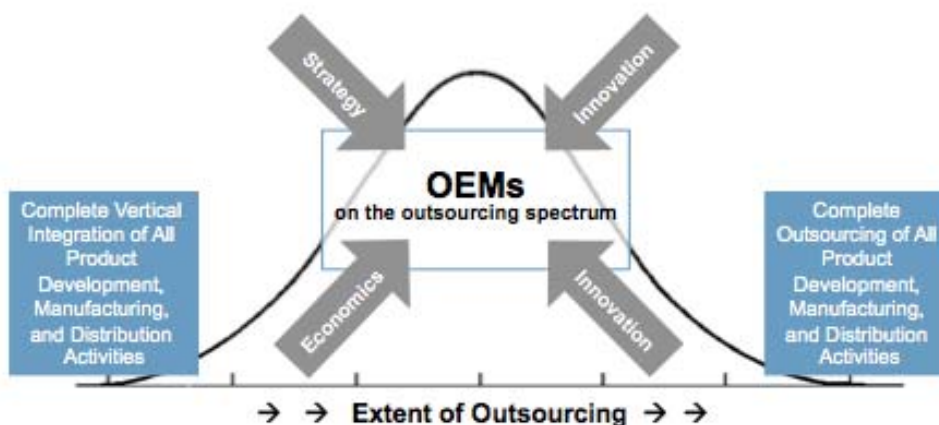
It’s important in hyper-competitive, ever-changing markets that OEMs keep their outsourcing arrangements flexible, so they can accommodate and respond to new operating and market circumstances that will inevitably arise over time. Four dynamic factors that can drive changes in outsourcing’s context typically are:

- **economic rationales**, both internal and external to the OEM;
- **accelerating innovations**, technological as well as process;
- **supply chain vulnerabilities**, such as component shortages and transportation disruptions;
- **enterprise strategy**, especially regarding intellectual property, pricing, and competition.

In this paper, we want to share insights into these dynamic factors that can impact an OEM’s outsourcing strategy, so readers can keep them in mind — either in making their initial outsourcing decisions or when they periodically review their outsourcing arrangements, as we recommend they should. We also want to emphasize the importance of finding outsourcing partners that are not only capable of delivering on their commitments, but who are also flexible in the services they provide, to keep pace with changes in their OEM customers’ outsourcing requirements. Of course, we believe Festo should be on the short list of those being considered.

## Gain strategic advantage by staying nimble on the outsourcing spectrum

Often outsourcing of product development and manufacturing is referred to as a “make-versus-buy” decision. While this label implies that the decision is binary (i.e., “either/or”), outsourcing spans a spectrum in practice, as illustrated in Figure 1.



**Figure 1. Bell curve showing one model of OEM outsourcing, affected by four key decision drivers.**

On the one end is complete vertical integration, in which nothing is outsourced; on the other, everything is outsourced, from product development through contract manufacturing to distribution. The former typically offers full control, fewer variables, and less execution risk, while the latter offers less control, more variables, and more execution risk.

But, given those trade-offs, why outsource at all? While there are many reasons, some of the biggest benefits are because OEMs can:

- **eliminate capital- and labor-intensive requirements** of owning and operating manufacturing facilities;
- **gain flexibility to align production with demand**, minimizing impacts on the OEM organization;
- **tap into innovative technologies and processes** that may be beyond in-house capabilities;
- **simplify procurement**, innovation management, and, if applicable, final assembly;
- **accelerate a machine's development, its time-to-market**, and its time-to-revenue, thereby increasing the machine's cumulative return to the builder over its life cycle.

Of course, most OEMs fall somewhere in the middle of the outsourcing spectrum, shown by the bell curve in Figure 1. Larger, well-established OEMs, with plenty of capital and skilled human resources, may gravitate toward vertical integration, while smaller OEMs, with less capital and in-house expertise, may tend toward outsourcing — although smaller OEMs may try to insource without knowing what they're getting into.

However, with ever-increasing globalization, technology complexities, and competition, more and more large OEMs are also outsourcing non-core, product-related activities, usually manufacturing and often also development. Although not an OEM, Apple is an example of a large corporation that began outsourcing non-core code development to Eastern European programmers in the years soon after the Soviet Union's breakup, at a small fraction of the cost of doing it in the Silicon Valley.

### **Sometimes outsourcing *isn't* the answer**

Outsourcing can be done across several levels: procuring intricate components; subcontracting complex subassemblies; and complete contract manufacturing. But regardless of what level an OEM pursues, the decision to go outside is critically strategic to the OEM's future success, even viability. That's because in doing so the OEM effectively assigns partial ownership of its success to the outsourcing partner, to the degree that a failure to deliver whatever is outsourced would impact the OEM's commitment to customers and shareholders.

This is why OEMs don't, or shouldn't, make outsourcing decisions lightly. However, those decisions often take place in emotionally charged environments due to potential impacts on key stakeholders. In particular, interested parties can include shareholders, who want the largest returns on their investments; employees, who want to keep their jobs; and the community at large, which would fear the economic consequences of a big layoff or loss of local factory operations.

Two rationales that can come into play when weighing an outsourcing decision should be avoided. One is to keep all or specific parts of equipment building in-house simply because

capacity exists. Conversely, the other is to assume that the nature and scope of work is well beyond the OEM's existing capacity and capabilities.

In fact, sometimes it makes sense to *keep* production in-house, but the decision to do so must result from a careful evaluation of an OEM's capabilities and capacity compared to industry and global benchmarks. Are the OEM's manufacturing assets and personnel world-class? If not, what levels of investment and training would help them become so? And how long would it take?

At the same time, an OEM must consider this: Even if its manufacturing would fall short of acceptable benchmarks, would those deficiencies be more than offset by the costs and risks of going out-of-house? Those offsets could include the transfer of intellectual capital; time of oversight and communication in managing the outsourcing relationship; and the costs in time and expense of logistics and transportation. If the answer is "yes," then serious consideration should be given to keeping the work in-house.

### Four dynamics driving the outsourcing decision, to be reviewed periodically

As mentioned earlier, outsourcing creates a new business context for an OEM that will change over time due to four dynamic factors: *economic rationales*, *accelerating innovations*, *supply chain vulnerabilities*, and *enterprise strategy*. That's why OEMs should review their outsourcing decisions periodically to ensure that where they are on the outsourcing spectrum still makes sense and is providing the expected hard and soft returns to their financials and both customers and employees.

Let's take a closer look at each of these factors:

- **Economic rationales:** For decades, cost-savings have been a main economic driver in outsourcing decisions. The rapid growth of manufacturing in low-cost nations during this time, plus improvements in logistics and transportation of outputs back to OEMs for final assembly or sale and distribution, have made outsourcing a compelling model to pursue. Outsourcing can save capital costs, while also turning many fixed overhead expenses into variable ones that can be more easily aligned with fluctuations in demand when they're outsourced.

Importantly, outsourcing complex subassemblies that arrive fully tested and ready to install can cut months, even a year or more, off design and development stages. By getting their machines to market that much sooner, OEMs gain that much more time to generate profits out of, say, a five- to seven-year product life cycle. If they're first to market, that gives them more time to command premium pricing; if they're late to market, that enables them to catch up faster.

In recent years, OEM outsourcing has come back onshore and in-house because many types of hidden costs have emerged. For example, administrative expenses and complexities, especially around managing suppliers and quality from a distance, can demand more management time and attention than expected. Another example is poor quality, resulting in reliability issues that must be addressed — expensively — with post-sale service and support. Outsourcing can also stretch out lead times more than expected, causing project delays for OEM customers.

As part of an OEM's periodic review of the type and quantity of work outsourced, once-hidden costs like these examples should be documented, then evaluated against bringing the work back in-house. If the OEM has engaged a reputable outsourcing partner, it should hold frank discussions with the partner about these issues during a formal review — in

addition to whatever feedback the OEM has presumably already provided at the time a particular problem arose.

- **Accelerating innovations:** Keeping up with both technological and process innovations is certainly a big challenge for small OEMs with limited staffs, but it can also tax the focus and resources of large OEMs with big staffs and big budgets. Advancements in chipsets, firmware, and software continue to occur at blistering paces. These, in turn, can enable new opportunities to drive process changes inside the operations of OEMs' customers, requiring either adaptations of existing machines or altogether new ones.

For OEMs, small and large, focus and prioritization are two interrelated keys to success that innovation can disrupt. For example, "feature-creep" is a common malady in product development, as designers seek to add yet another product feature or capability that a recent technology advancement might enable. But the addition must be evaluated against issues of increased manufacturing complexities, component sourcing, and other concerns about which a knowledgeable, well-qualified outsourcing partner could provide critical counsel. After all, designing and engineering a product from scratch is wholly different from designing and engineering the processes to build it.

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Good outsourcing partners should be able to help OEMs manage innovation throughout their machines' entire life cycles. Consider how Festo brought Piezo valve technology, proven in the automotive industry, to OEMs of medical devices and lab equipment as a replacement for older solenoid valve technology. Compact, space-saving Piezo valves are up to 95 percent more energy-efficient, with no operating noise or heat buildup, and provide more precise flow control and pressure regulation. Using its own considerable R&D resources, Festo adapted this technology for its OEM customers, so they could design this innovation into their devices and equipment to enhance capabilities, performance, and differentiation.

- **Supply chain vulnerabilities:** By outsourcing any or all manufacturing processes, OEMs introduce new risks to their business models from supply chain variables that are beyond their control. Some OEMs, especially start-ups with limited resources, may have no choice but to accept these risks and have contingency plans to mitigate them, if that's even possible. Examples of these vulnerabilities include component shortages, labor disputes, political upheavals, and transportation disruptions.

Managing supply chain vulnerabilities shows how management attention and staff time can be diverted from the oversight of other core operations — a cost that might be initially overlooked in the outsourcing decision but should be considered during the periodic review.

OEMs need to ascertain the ability of potential outsourcing partners to provide competitive pricing — not necessarily the lowest bid — for a specified term, along with high-quality output and on-time performance. OEMs should also have risk-mitigation plans with alternative suppliers and transportation ready to go, should their primary suppliers catastrophically fail to deliver. Festo's global footprint in 176 countries enables it to provide OEMs with guidance on these matters around the world.

- **Enterprise strategy:** Given the critical importance of the outsourcing decision, OEMs must determine its impact on overall enterprise strategy, during initial consideration of the

decision as well as during its recommended periodic review. An obvious example is the OEM start-up, whose investors need it to turn cash burn into cash flow as quickly as possible. While such an imperative might make a lowest-bid supplier look most attractive, the new OEM must consider the aforementioned factors in its supplier assessment to ensure it's not ultimately held hostage by supplier lock-in.

Another strategic consideration for any size OEM is defining its core development and manufacturing competencies, from which it can derive the most competitive advantage, the most defensible intellectual property, and, ultimately, the most profit from limited resources of expertise, time, and capital. An experienced and consultative outsourcing partner will understand these aims and help the OEM achieve them, while respecting and safeguarding the OEM's intellectual property. Unfortunately, too many low-bid suppliers don't do this.

To illustrate, often the most arduous step in outsourcing — sometimes a root cause for an outsourcing venture's failure — is transferring the institutional assembly knowledge from an OEM to the supplier. Of course, language and cultural barriers can be a challenge, but many candidate suppliers simply lack the ability to understand the OEM's assembly requirements.

Festo, in contrast, has a manufacturing facility that conforms to ISO 13485, the world's foremost quality management system for the design and manufacture of medical devices. That's on top of its long-standing ISO 9001 certification. But customers weren't requiring or even inquiring about ISO 13485 conformance; Festo adopted the standard to better understand the environment and challenges facing its medical device customers — and be that much more prepared to meet their needs.

A final example of how enterprise strategy can affect outsourcing decisions is whether an established OEM is an industry trailblazer or a fast-follower. The former strategy might suggest keeping assembly of an OEM machine's differentiating features in-house, while

## Criteria for qualifying a strategic outsourcing partner

While OEMs seeking a strategic outsourcing partner today should conduct sufficient due diligence to qualify their candidates, here are some criteria to consider:

- **Stability:** How long has the supplier been in business? Are they profitable? Can they handle major financial changes? Is their client portfolio broad enough to adjust to specific industry downturns? Will a relationship with this supplier make your company stronger?
- **Flexibility:** Can they support you as you adapt to growth and changing market conditions? In automation, for example, it makes sense to take a building block approach, working with a supplier that can supply low-level standardized components as well as designing them into, and supplying higher-order systems. This allows fast transfer of engineering and production in-house, or to other outside contract manufacturers as inevitable capacity and growth changes occur. The ideal supplier can supply parts, or design, build, document, and validate to your requirements, as needed.
- **Capacity:** Can your supplier handle growth? Do they have the resources to invest to accommodate for economic upturns as well as the growth of your company? Capacity is easy to find in a flat economy but can become critical just when business is growing and you need to deliver.
- **Knowledge:** Make sure your supplier can and will act as a consultant, understanding that adapting their scope of supply to meet the changing requirements of your business can result in a stronger business relationship by applying the best resources to assure rapid and profitable product development and production. Find a vendor that can be an asset. Require them to be more than a catalog product supplier, and gain a deep understanding of their level of service.



outsourcing the non-differentiating ones. The latter strategy might be accompanied by lower margins due to less pricing power, so more assembly would be outsourced to save costs.

### **Always keep end-goals in mind**

The late business author Dr. Stephen Covey published a blockbuster book called *The 7 Habits of Highly Effective People*. Its second dictum — Begin with the End in Mind — applies to outsourcing. In practice, an outsourcing arrangement is a marriage between the OEM and the supplier. And, like marriage, it should never be entered into lightly. Both parties must seek to know themselves and each other exceedingly well, especially the OEM seeking an outsourcing partner. After all, a strong partner can help catapult the OEM's next big idea into the greatest heights of success, while a weak one can torpedo it.

Nonetheless, because the factors driving an outsourcing decision can change over time, OEMs are advised to regularly review their supplier arrangements, keeping their end-goals in mind. Annual or biannual reviews are practical time frames. While these reviews will be opportunities to assess and provide performance feedback to the supplier, OEMs should also use them to ensure that their reasons and context for outsourcing are still aligned with and helping the company achieve those goals.

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