

Four Factors to Consider When Building Complex Production Systems



When machine builders partner with subsystem specialists to simplify and streamline their equipment design, engineering, production, and support, they can save large amounts of time and, in many cases, up to 50 percent of costs — helping to boost profitability and customer satisfaction.

Machine builders “own” their customers’ successes

When most people think of business ownership, they think about equity ownership. But savvy managers know otherwise: While other stakeholders may not own equity in their businesses, they may well “own” a share in a company’s current and future success and profitability that’s perhaps even more critical. Two examples are employees and customers. Strategic suppliers are a third.

Machine builders certainly qualify as strategic suppliers for their customers. Even a small machine used in a critical production process could cause costly disruptions if it would fail — the venerable “weakest-link-in-the-chain” theory. The irony is that the weakest link in any chain by default becomes its most valuable link. Of course, no machine builder wants to base their reputation on that phenomenon.

Selling trust. As a machine builder and strategic supplier to your customers, you’re selling more than your ability to address one or more of their production challenges. You’re selling your expertise and understanding of their business, plus their trust in your ongoing support and future financial viability to provide that support and upgrades over the machine’s life cycle.

That’s why your company’s own profitability is so important now and in the years to come. It will determine if you’re around to meet your customers’ needs, as well as your employees’ needs for their jobs, and your equity shareholders’ needs for a return on their equity.

It’s also why we want to share with you in this paper four key factors to saving substantial costs and time by considering how Festo can build fully assembled, tested, and ready-to-install subsystems for your own complex machines.



Who owns your success? Make-or-break factors that must be addressed

If you own a stake in your customer’s success, who owns your success? It’s not just your equity owners and strategic stakeholders like those we just described. You’re probably aware of at least three other factors that can make or break your business: expertise, time, and complexity. In real ways, these factors can “own” your success, too, if they’re not constantly addressed.

For most machine builders these days, expertise and time may be in short supply, while the battle against complexity seems never-ending. Let’s consider how these issues can affect the various roles within your company:

- **General Manager** — Inside company operations, you have to ensure assets and people are fully utilized every day, minimizing idle inventories and idle time. You need employees engaged, doing their best. Outside the company, you worry about keeping customers satisfied, the competition at bay, and shareholders amply rewarded.
- **Engineering Manager** — Your desire to learn new technologies and new ways to engineer solutions is limited by continuous time pressures to compress cycle times and always complete work faster — yet ensure the highest quality. Wherever you can, you seek to simplify, but keeping up with technology innovations can be difficult.

- **Procurement/Purchasing Manager** — How many vendor catalogs and parts portals have you bookmarked? It's tough to ride herd on the company's many different suppliers, with all their different part inventories, allocations, delivery dates, prices, and terms. Keeping up with their component innovations and evolving life cycles is tough for you, too.
- **Service/Support Manager** — Responsiveness is Job #1 for you and your team. Customer deployments must run to specification always to avoid costly production disruptions. Parts for maintenance and repairs must be stocked. Documentation must be up-to-date and easily referenced. Vendor "finger-pointing" must be avoided, but it seems to inevitably occur in proportion to the number of vendors who are part of your machines' assemblies.

To make your work lives easier, chances are you may often weigh the benefits of developing your own in-house solutions against buying them. On the one hand, homegrown approaches can keep employees busy and engaged and save the cost of going outside. They can also offer more control of the end-to-end, machine-building process and important outcomes like quality as well as on-time, on-budget deliveries.

On the other hand, going outside can save your assembly team members' time and let them focus on your company's core competencies. It also can take the assembly of complex subsystems off a project schedule's critical path. In turn, this can reduce project risks, especially unforeseen costs and bottlenecks associated with integration, testing, installation, and commissioning. Control of the end-to-end machine assembly process as well as overall quality don't need to be sacrificed either, if you have properly qualified and engaged your supplier partner.



Making the case to engage a qualified partner for ready-to-install subassemblies

With decades of experience and a global service and support network, Festo manufactures a wide range of what we call "ready-to-install" subsystems for all kinds of machines used around the world in just about every industry, including automotive, aviation, biotech and pharmaceuticals, food, packaging, printing, textiles, water, and many more.

Our solutions come fully engineered and built to our customers' exacting specifications and are fully tested. These two steps can save our customers considerable amounts of time and, in many cases, cost-savings of up to 50 percent compared to in-house approaches. And whether delivered for installation to our customers' facilities or to their customers' production sites, our ready-to-install solutions are essentially plug and play, making their installation quick and easy.

What follows are the four key sources of those time and cost savings — the factors and benefits we consider most important in your make-versus-buy business decisions:

- **Factor #1: Reduce design time.** Working closely with our customers, we learn as much as we can about the purpose of the larger machine they're building and its production context. We advise on the best subassembly configuration for their needs, tailoring its specifications for the performance required. This step reduces the design time for the

particular subassembly. For especially complex subassemblies, it eliminates learning curves or hiring expensive outside expertise, while reducing project risk.

- **Factor #2: Reduce engineering time.** With detailed functional and technical specifications agreed upon, we get to work, taking on all the engineering responsibility a customer's subassembly would need. And we base our engineering on our experience and optimal approaches gained from working on hundreds of other relevant solutions. So, in addition to saving design time, we reduce or eliminate the time — and possible costly pitfalls due to inexperience — of engineering subassemblies in-house.
- **Factor #3: Improved inventory management.** Work-in-progress (WIP) inventory is a major cost driver when assembling systems from components. In-house subsystem assembly requires keeping an inventory of those components and tracking their use. In contrast, we deliver the subsystem assembled and ready to install. This reduces overall assembly time, saving labor and inventory costs, while helping to ensure delivery commitments are met. A big plus: Our customers have only one part number to track — the Festo-built subassembly.
- **Factor #4: One contact point.** What comes with just one part number to track is just one call to make for support or service — virtually anywhere in the world, wherever your machine might be destined for use. In fact, we offer support and service in 176 nations. This can contrast with building complex subassemblies in-house, which can require managing tens if not scores of component sources, parts, numbers, prices, terms, and conditions.

Ready-to-Install: A Mini-Case Study

In just 14 weeks, a machine builder had to update its customer's existing top-loading case packer to boost performance from 30 to 40 packages per minute, plus enable it to group and multi-pack several product variations. Festo was called to help with several ready-to-install sub-systems.

To improve the machine's overall cycle time, Festo replaced its existing pneumatic handling system with a fully assembled and tested electric handling system, including electromechanical actuators, servo motors and an energy chain, all designed to mount on the machine frame.

The new system's control cabinet contained electric servo amplifiers, a CoDeSys programmable logic controller and an HMI. To control the remaining pneumatic equipment, Festo provided a pneumatic filtration unit and valve terminal. Both control systems were virtually plug-and-play, making installation fast and easy.

Festo also installed a vision system to provide 100 percent pick-and-place accuracy. The end-of-arm tooling remained the original vacuum gripper.

In addition, Festo delivered the fully tested, ready-to-install systems within 8 weeks from initial concept development — 6 weeks sooner than the project deadline — allowing the machine builder to focus on other critical steps in meeting the customer's aggressive timeline.

What's more, Festo simplified the logistic process: The handling system, if purchased as components, would have consisted of 36 part numbers, each to be ordered and managed individually. By purchasing a ready-to-install system, all of the same components were delivered as one part number — from Festo.

Example: Partnering to build a Cartesian material handling system

To illustrate how these factors can come into play and benefit a machine builder, consider Cartesian material handling systems. Larger machines often incorporate these as subsystems, using various technologies to manage the linear or rotational movement of feed stocks, work-in-progress, and finished goods throughout a production process. Conventional robot solutions are often too large for many applications. They can also offer more functions and degrees of movement than a process may actually need.



Keep it simple. But designing, engineering, and building a Cartesian material handling subsystem is a complicated task — or, more appropriately, a complicated set of many tasks. One of those is procurement. Depending on the application, parts from more than 30 suppliers can be required. It can be extremely time-consuming to qualify and manage that many suppliers, not to mention the capital and holding costs of inventory. If any of those components causes a problem in themselves or in their integration with and operation of the subsystem, troubleshooting and solving that problem can take much more time and effort than dealing with a sole source.

Turnkey expertise. Other tasks include design and engineering. Inexperience will require a learning curve and can introduce project risk in many ways. One is that it often leads to over-engineering the subsystem — “just to be sure” — which can inflate costs unnecessarily and add complexity. Mixing and matching untested components can increase that risk. That’s compared to a sole source of ready-to-install Cartesian handling subsystems, based on optimized, plug and play designs and engineering proven in deployments worldwide.

Partnering for greater competitiveness, customers satisfaction, and profitability

Builders of complex machines must often meet aggressive delivery schedules and budget constraints. That’s why going outside to a highly qualified partner like Festo for particular subassemblies can help simplify and streamline design, engineering, and production processes. It can also make procurement much easier to manage.

In all, Festo’s ready-to-install model lets your company focus more of its limited time and expert resources on the most critical steps in ensuring timely, on-budget deliveries. It can help you save up to 50 percent on component costs, compared to what an in-house approach would need. Back-end service and support is simplified, too, especially with Festo’s global network of offices and distributors that spans 176 nations.

Ultimately, an intelligent, well-considered business case can be made for engaging Festo as your strategic supplier of specific, ready-to-install, fully assembled and tested subsystems. The results can be greater competitiveness, customer satisfaction (and referrals), and profitability.

Festo’s full ready-to-install solutions portfolio includes:

- **Handling systems**, for simple and complex handling tasks from pick-and-place to customized 2D and 3D handling or parallel kinematic systems.
- **Control cabinets**, custom-configured for factory and process automation and handling systems.
- **Product modules**, which are pre-assembled function units using any combination of pneumatic and electrical components required.
- **Integrated solutions, compactly** designed for use in small spaces not needing tubing. Examples:
 - Manifold duct plate (two variants)
 - Cartridge solutions
 - Profile solutions
 - Sheet-metal constructions
 - Function blocks
- **Mounting plates**, with pneumatic and electrical components fully assembled.
- **Hall and robot installation plates**, for the control and monitoring of compressed air and coolant supply for welding cells and welding robots.

For more information, please visit https://www.festo.com/cms/nl-be_be/18452.htm.

Festo Corporation

Phone: 1.800.99.FESTO

e-mail: customer.service@us.festo.com

www.festo.us