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**Project Scalability: Can Your Contract
Manufacturer “Right Size” to Fit Your
Needs?**

Project Scalability: Can Your Contract Manufacturer “Right Size” to Fit Your Needs?

By Curtis Campbell

One of the biggest benefits of outsourcing is the reduction in capital investment and in-house technical talent requirements that a manufacturing partner can bring. One of the biggest potential risks is that transfer costs can be unexpectedly incurred if the project outgrows the contract manufacturer’s capacity to build it or doesn’t grow as rapidly as originally projected at a contract manufacturer predominately interested in high volume projects.

When project scalability is a concern, the best option is to find a contract manufacturer with a flexible enough approach to accommodate a full product lifecycle in terms of changing volumes, cost pressure and specialized requirements.

Changing Volumes

Changes in project volume assumptions are often the biggest driver of poor alignment with a contract manufacturer’s preferred business model. The lower the volumes, the more disruptive a project is to production flow in a high volume production facility because of the number of changeovers small lot sizes drive on production lines. A contract manufacturer may choose to accept low volume work and the associated disruption on the assumption that it will grow quickly. If the ramp to volume production is slower than expected, the end result is that the project can become a problem child with low priority in production scheduling, missed deliveries and/or price increases.

While a job shop or regional manufacturer may be ideally structured for prototypes and initial production volumes, this type of business can quickly become overwhelmed if production volumes grow. Small contract manufacturers often face two challenges when volumes spike: equipment capacity and the financial resources to fund inventory requirements.

Similarly, lower volumes emerge at the end a project lifecycle. Once again, the project becomes a low priority problem child in a higher volume production environment. The cost of transfer at this point is likely not recoverable in terms of lower pricing or greater efficiency.

SigmaTron International recognizes the challenges that come with variable volumes and customizes its solutions to fit project requirements. Each of SigmaTron’s facilities offers traditional contract manufacturing services plus unique advantages tailored to the region. The Silicon Valley facility is designed to support the complex technology needs of the region, both in terms of short-run and volume production. SigmaTron’s Elk Grove Village, IL facility supports companies wishing to nearshore some of their production within the region, plus offers automated solutions for legacy products. The China

facility is licensed for import into China, as well as for export to other markets. The Vietnam facility adds a lower labor cost option in Southeast Asia. Three Mexican manufacturing facilities provide logistically simple, highly cost competitive North American sourcing options for margin sensitive product. All facilities are registered to ISO 9001. The U.S., Tijuana, Mexico and Suzhou China facilities are also registered to ISO 13485 to ensure that medical customers have a wide range of location choices. The Tijuana, Mexico facility is also registered to ISO/TS16949 to support automotive market requirements.

SigmaTron's standardized systems help its team launch new projects and address scalability issues easily. The Bills of Materials (BOMs) are entered into Agile as received. Valor is used for design for manufacturability/testability (DFM/DFT) recommendations to mitigate defect opportunities while optimizing efficiency.

SigmaTron's proprietary SCORE customer portal gives customers visibility into project status, which can be critical when project volumes are changing rapidly. Through SCORE, a customer's program team can:

- Track product through the manufacturing process with order, manufacturing, and shipping status available 24/7
- View data real-time to see changes as they happen
- View an order notes feature that gives them visibility into any information SigmaTron's team adds
- See all the details of shipped orders with just one click.

Systems commonality throughout SigmaTron's facilities also makes it easy for projects to transfer among facilities as requirements change with minimal transfer costs. In some cases, customers opt to use a dual facility strategy which places production near their engineering teams, production facilities or end markets. In these cases, systems commonality and centralized program management enables a multi-facility build to be managed as a single supplier.

Addressing the Cost Pressure Equation

Establishing and maintaining market share typically requires strong focus on both innovative features and competitive cost. Another benefit of outsourcing can be access to engineering and supply chain expertise, when the contract manufacturer has those resources in place. SigmaTron's business model provide advantages in both of those areas.

Internally, SigmaTron International's engineering group offers a joint development model for companies needing product development support aligned with the engineering group's design competencies. Application-specific design firm strategic alliances are in place for products which require more specialized support.

The engineering team uses a shared development business model to engineer customer-owned products which may license some of its proprietary software. Its product development expertise includes:

- Software-driven controls
- Analog controls
- Micro-processor controls
- Switching power supplies
- Near field communications (NFC)
- Smart grid data streams
- A broad range of human interface user I/Os
- Variable speed drives for small frame motors
- Industrial design
- Packaging.

A key benefit of this internal engineering capability is that it allows engineering resources to be customized to customer needs, in some cases providing “as needed” engineering support over the entire life of the product. The team’s expertise with a broad range of communications and display technologies aligns well with the evolving nature of many medical diagnostic and instrumentation applications.

SigmaTron’s Supply Chain Management (SCM) team also plays a role in helping customers achieve competitive cost. Material typically represents 60-80 percent of unit cost in the outsourcing equation. While good commodity management may identify some cost reduction opportunities, efficient SCM is also a large part of the cost reduction equation. To execute an SCM strategy that truly involves adding value to the outsourcing effort, a contract manufacturer needs to focus on developing a strategy that highlights exceptions in real time, minimizes the risk of supply chain disruption, can flexibly support customers’ changing requirements and procures competitively priced, superior quality parts.

SigmaTron’s model relies on centralized supply chain management coordinated with its International Purchasing Office (IPO) in Taiwan. The IPO identifies best sources and monitors trends in each commodity. Team members are Green Belt-certified and use Six Sigma tools to analyze supplier quality issues.

There is centralized management of key commodity segments such as printed circuit boards, semiconductors (ICs and linear logic), power products, connectors, electronic components (relays, electrolytic, ceramic and film capacitors), plastics and metals. This approach helps minimize supplier count by establishing a core of competitively priced suppliers with the right mix of capabilities. In SigmaTron’s model, major commodities undergo periodic review, depending on pricing volatility, to

ensure pricing stays competitive. This type of approach provides customers with a clear path to best cost competitive options.

The IPO team regularly helps customers identify alternate suppliers and cost reductions. In one case, the custom display commodity manager found three alternate suppliers that were 20-50 percent below the cost of the suppliers that the customer had identified. In another case, the team audited a customer-selected supplier that looked very well established on the internet, but in reality turned out to be a small shop incapable of handling the customer's projected volumes for a custom mechanical part. The commodity manager was able to identify alternate cost competitive sources that could produce in the required volumes.

The risk with any centralized model is the possibility the unique needs of individual facilities are ignored. Another potential downside can be excess transport of materials which might better be sourced locally or within a specific region.

SigmaTron's SCM model addresses this with local purchasing teams supporting each facility. While the IPO is integral to the overall commodity management effort, each team can source locally when that addresses regional business requirements. The local teams also identify potential suppliers within their region who may be a fit for global or regional sourcing, particularly in the area of maintenance, repair and operating (MRO) supplies.

Distribution is also an important option in SigmaTron's Lean SCM strategy for three reasons. First, they Lean the supply base by representing a common source for many varieties of components, enabling SigmaTron to purchase against customer AVLs without adding suppliers. Second, they have optimized their services to align well from a systems perspective and they are well positioned to support vendor-managed inventory (VMI) programs. Finally, franchised distributors represent a known chain of custody for the manufacturers they represent. This can reduce material integrity documentation requirements and helps eliminate the defect opportunities that counterfeit components can otherwise create.

Support for Specialized Requirements

The benefits of consolidating a supply chain is that there is less to manage, fewer transaction costs and less redundancy in core activities. The same benefits are even more true when outsourcing to a contract manufacturer, provided the contract manufacturer can support specialized requirements over the life of the product. In those cases, costs that can be eliminated include:

- Product transfer costs, non-recurring engineering and internal staff costs that occur every time a project is transferred to a new contract manufacturer
- Redundant test equipment costs when production, repair depot and end-of-life product support are divided among multiple contractors

- Extra inventory costs when post-manufacturing support activities and production activities are divided among multiple contractors
- Extra transit leg logistics costs when products ship to the OEM instead of end markets or regional stocking points.

However, not all contract manufacturers are able to provide that degree of support. It is important to access a contract manufacturer's suitability for delivering that range of services in the initial selection process.

SigmaTron customizes its product development, manufacturing and post-manufacturing support to address the requirements of each of its customers. It offers product development support through its engineering group and strategic design firm alliances. The supply chain management and systems expertise highlighted earlier is utilized to provide multiple options in addressing challenges such as variable demand and product obsolescence issues. Systems expertise also facilitates transparency and collaboration in repair depot activities, enabling rapid identification of root causes of field failures and implementation of any required corrective actions. The ability to support fulfillment strategies by shipping direct to end customers or distribution points helps minimize shipping time and expense. Once again, real-time systems help ensure complete visibility into this process.

Carefully evaluating the ways project requirements are likely to evolve over time can help in selecting a contract manufacturer able to "right size" project support resources to scale up and possibly down as requirements change. Making the right choice not only eliminates unplanned project transfer costs; it also increases the technical expertise focused on reducing product manufacturing and fulfillment costs.

Curtis Campbell is SigmaTron International's Vice President of Sales, West Coast Operations. He can be reached at curtis.campbell@sigmatronintl.com. For more information on SigmaTron International's capabilities, visit www.sigmatronintl.com or call 510-477-5000.