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Simplifying Sourcing Series

Outsourcing in Mexico: Is This Location the Best Fit for Your Project?

Outsourcing in Mexico: Is This Location the Best Fit for Your Project?

By Curtis Campbell

The last few years have challenged every supply chain manager's ability to craft a successful outsourcing strategy as perceived advantages have shifted due to tariffs, changes in tax policies, new trade agreements and unanticipated supply chain disruptions.

There are some universal truths relevant to outsourcing at a distance:

- Transferring a project incurs significant measurable costs plus difficult-to-predict costs such as new supply chain learning curve inefficiencies, added staff time and travel, and the cost of any unanticipated quality or product delivery delay issues resulting from the transfer
- Regional supply chains tend to be optimized for the product types and volumes most common in the region
- Selecting locations based on labor cost alone increases the risk that cost advantages may not be sustainable
- Lower volume project support costs often exceed the cost savings of moving to a lower cost labor region
- Selecting an offshore contract manufacturer with a bid far lower than the rest of the contract manufacturers in the region may result in quality, delivery timeliness or scope of support surprises.

Mexico offers significant advantages to companies looking for offshore pricing and logistics simplicity. However, it is not universally advantageous for all projects. This whitepaper looks some key issues that should be considered when evaluating the viability of outsourcing in Mexico, and suggests issues to consider when evaluating Mexican contract manufacturing options.

As the points above highlight, any changes in outsourcing strategy should be carefully considered in terms of total cost of ownership, long-term regional attractiveness and the alignment of project requirements with contract manufacturer support capabilities.

Project Transfer Considerations

Mexico's labor costs are relatively low, worker productivity and automation are high, and the proximity of Mexico to the U.S. simplifies both logistics and staff oversight. Most contract manufacturers have bilingual (English-Spanish) staffs at the engineering and management level, and other languages may be supported, as well. These advantages support smooth project transfers.

That said, regional supply chains tend to be optimized to support the products built in the region. At a printed circuit board assembly (PCBA) level, that doesn't matter because distribution channels are strong in Mexico. At a fabricated part level, it can matter. Finding regional suppliers of high volume

fabricated metal and plastic parts is typically not a problem. However, locating part fabricators willing supply these parts in lower volumes may be an issue in some areas. As a result, supply chain availability for lower volume projects with a higher number of precision-engineered parts should be carefully evaluated. For example, Mexico's aerospace industry is clustered in the states of Baja California, Chihuahua, Queretaro and Sonora. Suppliers capable of providing precision-engineered parts in smaller lot sizes are more likely to be found in those areas.

A final area to consider is team competency. Over the last 20 years, Mexico's manufacturing industry has been growing while U.S. manufacturing jobs have been shrinking. As a result, engineering talent, experienced and trained assemblers, Six Sigma Black Belts and experienced program management are all present in Mexico.

At SigmaTron, the New Product Introduction (NPI) process starts with the receipt of CAD files from the customer, along with a bill of materials (BOM) and approved vendor list (AVL). Design for manufacturability (DFM) reviews include a report with specific recommendations on any issues, that should be addressed prior to production start. Customer BOMs for longer life products also undergo a lifecycle analysis at the quote stage. SigmaTron uses an outside service to provide more detailed custom reviews, when agreed upon as an additional service. The analysis normally looks at the lifecycle stage of each component, how many years it has been in production, the anticipated number of years to end-of-life, available alternate components and links to datasheets.

Design for testability is also evaluated. The analysis includes a look at test coverage and whether the correct soldermask openings are in place. The goal is to create a robust verification process with as much coverage as possible. At the same time, customer preferences for cost of test are also considered. SigmaTron provides a range of test options which include in-circuit test (ICT), automated optical inspection (AOI) and automated x-ray inspection (AXI).

Other issues that can potentially impact production cost are also evaluated as the process flow is designed. For example, a product with mixed technology may be analyzed to determine the most cost effective way to solder the through-hole parts. This focus on developing the most efficient process flow is particularly beneficial for highly regulated products where there may be limitations on process changes once the product is in production.

Once the process flow is approved, SigmaTron's use of leading edge software enables machine programming to be done using the CAD data. This reduces production time and ensures accuracy.

Product and process validation is done based on customer requirements. Any issues discovered during NPI and pre-production runs are documented and provided to the customer. The goal is to eliminate defects by eliminating defect opportunities wherever possible.

SigmaTron's systems and engineering support are set up so that any of the facilities in its global network, including its three facilities in Mexico, can offer this robust a product launch process.

Longer term within the project, product nearing end of life (EOL) can either be supported at the same facility or easily transferred to a U.S. facility, depending on customer preference.

Questions to ask in evaluating a contract manufacturer's capabilities in this area include:

- What is the structure of the NPI team?
- Is there a documented process for NPI?
- If this product has never been outsourced before, what is the team's process for ensuring there are no gaps in production documentation and their understanding of the current production process?
- Is there a track record of transitioning projects of similar size and scope?
- Are DFM/DFT recommendations provided?
- Will there be feedback on lessons learned in the qualification run?
- What systems are used to proactively address obsolescence risk?

The Logistics Equation

Location in Mexico can also impact logistics costs and this area should be evaluated closely if manufacturing for export rather than for a customer in Mexico. Labor costs in border regions may be higher than those in the interior. However, Mexico's highway system is not well maintained in all areas and product packaging may need to be increased to address the shock and vibration associated with bumpy roads. In some cases, product may need to be transported by air from interior cities such as Guadalajara if the end destination is the U.S or a Mexican border city. Trucks on lesser travelled highways have a hijack risk and additional insurance may need to be purchased to cover those shipments. Consequently, any difference in labor rates may be cancelled out by the added logistics costs. Comparatively, in the export scenario border locations eliminate virtually all of those risks since transit time from the factory to the border is short. For example, shipments leaving SigmaTron International's three Mexico facilities which are at or within 10 to 200 miles of the border are generally through Customs in no more than 24 hours. When product is being shipped to an OEM within Mexico, proximity to that site should be evaluated. Border or near border locations are typically convenient to support manufacturing clusters throughout Northern and Central Mexico.

While Mexico offers logistics simplicity when compared with offshore options, there is a still a border crossing which adds cost. Contract manufacturer capabilities can vary in this area. In some cases, logistics support is entirely handled via third-party customs brokers and in other cases it is done in combination with third-parties based on what solution represents optimum cost. It is important to understand what impact a contract manufacturer's logistics support strategy has on frequency of transit, tariff mitigation and typical crossing times.

SigmaTron International uses a combination of internal import/export departments within its Mexico facilities plus third party logistics and customs brokerage services to ensure that logistics and customs costs and/or duties are minimized. In-plant import/export teams electronically file all required documentation to optimize accuracy and efficiency.

SigmaTron's team can help customers with initial product customs classifications and determine the appropriate classification to comply with regulations and minimize duties.

SigmaTron also maintains warehouses in San Diego, CA; El Paso, TX; and Del Rio, TX to optimize the flow of materials and finished goods across the U.S.-Mexico border by having a U.S. ship to/ship from point. Raw materials are received in the U.S. facilities and shipped to factories in Mexico. Finished goods kanbans may also be located there to ensure support for variations in demand. SigmaTron's Acuna and Tijuana, Mexico operations execute daily crossings of both materials and finished goods, ensuring rapid response to shifts in demand within the normal crossing schedule. The Chihuahua facility finds consolidating shipments represents the option best aligned with optimum cost and response to its customers' requirements.

Questions to consider include:

- Does the company have in-house customs support and/or a strong relationship with a large customs broker?
- How frequently are inbound materials and outbound products crossing per week?
- What systems are in place for tracking inbound material status?
- Is there a U.S. warehouse that can hold finished goods kanban to support variable demand?
- Can the contract manufacturer assist with the initial product customs classification?
- Are there any additional insurance costs related to product transportation by truck?
- Have there been any issues with truck hijacking or shipment tampering?

Do the Contract Manufacturer's Capabilities and Business Model Fit Your Needs?

As with any low cost manufacturing location, there are a broad range of contract manufacturing options within in Mexico. At the lowest end of the equation, there are indigenous companies that manufacture products with very few quality checks and balances. These companies may offer attractive pricing, but a site audit will quickly demonstrate where the costs are being cut. There are also a good selection of companies with the requisite quality certifications and best practices to support superior quality production. The challenge is determining which of those have the systems and capabilities which best fit your product in terms of:

- Quality system infrastructure and supported quality system registrations
- Supported product volumes and lot sizes
- Automation optimized for products of similar size and scope
- Materials and engineering support
- Systems which provide project status visibility.

Evaluating potential contract manufacturers based on their performance with projects of similar technology, size and scope is an excellent way to determine whether the contract manufacturer's preferred business model aligns with project characteristics.

Questions to consider include:

- How many projects of similar technology, size and scope are present in the facility?
- What investments is the company making to support projects of similar technology?

- How well do the contract manufacturer's systems support your real-time project status visibility needs?
- Do their systems support your product's real-time data collection and traceability needs?
- When likely project volumes are considered, will the quoted cost savings outweigh the likely costs of working cross-border?
- Does the contract manufacturer have a facility network that can support a change in regional strategy over time?

SigmaTron's multiple quality system certifications, robust systems and network of facilities enable it to cost effectively support a range of product types and volumes, from mission critical, heavily regulated industries to consumer products, in Mexico, Asia or the U.S. More importantly, that network of facilities also makes it easy for customers to evaluate the costs of manufacturing in various regions and decide on the option that makes the best sense for their products and overall strategy. Longer term, that level of facility options enables seamless transitions to other regions should project requirements change.

In high volume manufacturing, a move to a lower cost region almost always saves money. Mexico's proximity to the U.S. enables those savings to accrue with lower volume projects, as well. However, labor content, demand variability, proximity to end market, regulatory factors and product maturity all impact the equation. Selecting a contract manufacturer whose support systems, capabilities, facility location(s) and business model represent the best fit helps ensure a sustainable strategy.

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