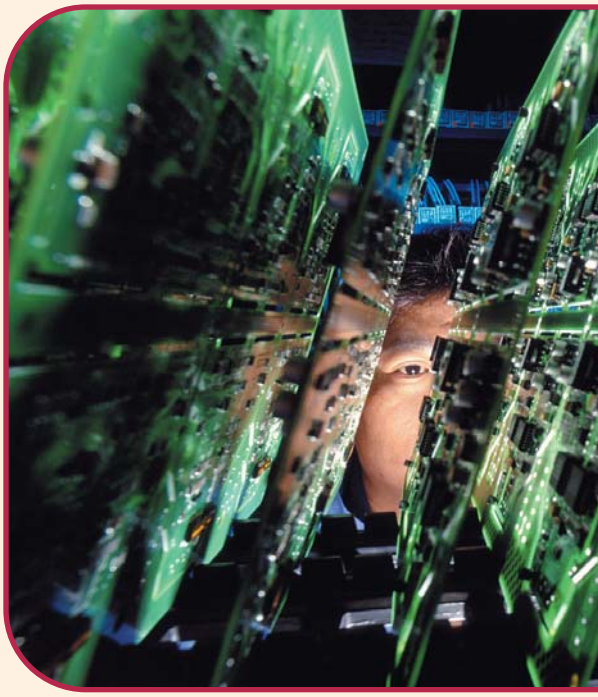
Calculating the *Total* Costs of Offshore Outsourcing



Susan Mucha

Is your product suited for offshore manufacturing?

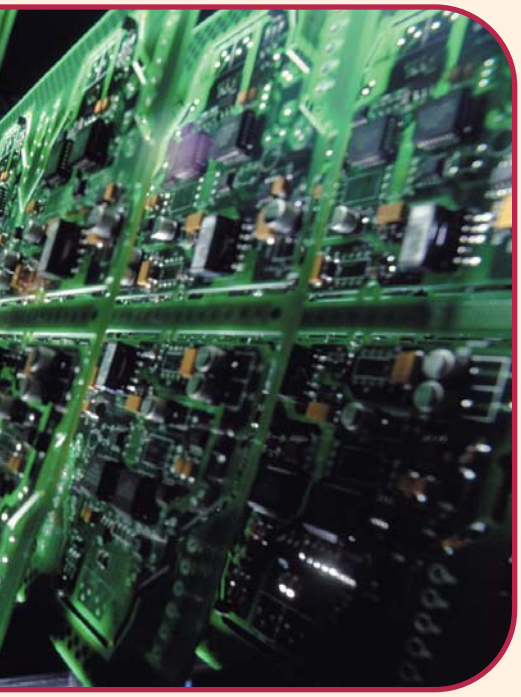
Several years ago, an industrial products manufacturer facing margin pressure decided to move a portion of its outsourced manufacturing to China. Today, that manufacturer is reevaluating part of that decision because of lack of schedule flexibility.

"We supported our customer's desire to move portions of their manufacturing to China and actually engaged in an alliance with a Chinese manufacturer to support that move," said Steve Johnson, vice president of engineering at Reptron Manufacturing Services (Tampa, FL). "Some of it is continuing to generate genuine cost savings. However, a couple of products are incurring opportunity cost because their weight makes air shipment too costly in terms of actual dollars and sea shipment too costly in terms of loss of schedule flexibility. Those products are being reevaluated for domestic production."

Highly automated products can also be misleading in terms of cost savings. "One of our medical customers had us bid a single-sided surface-mount board with some radio frequency (RF) capability," Johnson added. "There was only a 6 to 7% difference in China versus the U.S. They decided to stay in the U.S. because the cost savings didn't offset their perceived loss of flexibility."

Failure to calculate opportunity cost is not unusual. China and other low-cost labor regions have gained significant popularity over the last few years. In many of these developing regions, electronics manufacturing has gone through more than two decades of maturation. Offshore electronics manufacturers in these regions include both foreign subsidiaries of well-known U.S. original equipment manufacturers (OEMs), U.S. electronics manufacturing services (EMS) providers and "home-grown" OEMs and EMS companies. Virtually any manufacturing service available can be performed in these low-cost regions with similar levels of quality and technical expertise.

Reptron Manufacturing Services is expanding its presence in Dongguan, PRC.



However, not all products are a good fit for offshore manufacturing. Some issues to consider include:

• **Percentage of labor content versus total product cost.** High dollar equipment appreciation is almost the same the world over. Labor cost savings are driven in large part by reductions in manual labor costs. Consequently, highly automated products may not show significant cost savings.

• **Weight of product**. Lighter products with small footprints can be cost-effectively air shipped. However, heavier products or a lightweight product with a disproportionately large footprint can be fairly expensive by air. Sea shipment takes four to six weeks, automatically creating an inventory pipeline whose cost tends to be carried by the customer, not the offshore manufacturer.

• **Schedule flexibility requirements**. Offshore manufacturers do not offer the same degree of flexibility as onshore manufacturers, partly due to the disciplines that evolved when developing regions were considered only for high-volume production and partly because of the logistics associated with transporting products back to the customer. Sea shipment definitely impacts schedule flexibility, but other considerations include the economies of scale achieved through shipment combination at freight forwarders and the offshore facility's material procurement practices.

• **Maturity of product**. While most offshore facilities have English-speaking engineering and program management personnel, communications issues can occur when working at a distance. The more engineering change orders (ECOs), the greater the potential for degradation of quality. Additionally, a product in the inventory pipeline may have to be reworked when it arrives onshore.

• **Total mix of product**. Many OEMs outsource a basket of products that includes varying volumes, labor content, complexity and maturity. Domestic EMS companies competitively price the bid to get the good in these baskets, but the same is not always true of offshore manufacturers.

• **Security considerations**. Avionics and defense-related products may have restrictions or export licensing requirements associated with the technology. Failure to comply with those requirements can create liability for significant fines. Also, some products have production lot and/or component traceability requirements requiring some level of English-speaking administrative record-keeping support.

• **Patent protection**. While reputable EMS companies take protection of proprietary information seriously in all their facilities, smaller offshore EMS providers may not have the same level of protection in place.

"We've done some very rough calculations and estimate that a 15 to 20% cost savings is necessary to justify moving production offshore to counter the added costs of freight, customs, homeland security fees, logistics, inventory carrying cost and reductions in cash flow," said Gary Larson, vice president, sales and business development, Electronics Systems Inc. (Sioux Falls, SD) "Cash flow can be a significant issue because many offshore manufacturers expect payment upon shipment via wire transfer versus net 30 or net 60. Plus, in

Infectious Disease in Developing Countries

The Severe Acute Respiratory Syndrome (SARS) outbreak in China and its subsequent spread to other parts of the world has highlighted a potential issue that has been present for some time: Areas of the world that are the least expensive to manufacture in are low cost because the standards of living and government regulatory infrastructures are significantly lower than those found in more developed countries. Diseases such as tuberculosis, cholera, hepatitis and gastrointestinal parasites are rarely found in fully industrialized economies, but thrive in less developed regions of world. These infections have been relatively easy for business travelers to avoid through vaccinations, careful eating habits and good hygiene practices.

The SARS cover-up that enabled the initial spread of the disease is also not unusual, given the dependency of many of these economies on outside investment.

The ease of transmission of SARS has dollarized the cost of the issue because of the visible precautions being taken, such as the voluntary quarantines of employees following travel to infected regions of the world, added medical personnel in some offshore facilities, cancellations of customer visits and prohibitions on sales calls from EMS providers predominately focused in Asia.

Even after a vaccine for SARS is developed, the potential risk of infectious disease in low labor cost regions needs to be considered in strategy evaluation. The lack of healthcare infrastructure and poor hygiene practices that facilitated the SARS outbreak will still exist in some regions. This risk should not eliminate a region from consideration—companies have saved money manufacturing in Asia for decades without SARS and will continue to do so—but the associated opportunity costs and risks should be evaluated when looking at the total cost of the solution.

some cases we support very low-volume products where minimum material buy requirements exceed annual requirements by stocking that inventory, which is typically not done offshore."

Larson added, "One of our customer's large programs stayed domestic for the above reasons. Even though it was a relatively high-volume product, the engineering changes were frequent and the schedule was somewhat volatile, requiring flexibility in the manufacturing and delivery schedules—something the offshore suppliers could not accommodate. Also, our customer wanted very short lead-times, so we established a kanban process for a three-day lead-time. Logistically, offshore suppliers would have a difficult time supporting that lead-time window. Another contributing factor was that our facilities were within a few hours of each other, making it easy for their engineers to come to our facility and our engineers to go to theirs. Problems could be solved face-to-face in hours, not days."

Although recognizing the value of its domestic operations, Reptron Manufacturing Services is also expanding its presence in China. "We started with a simple alliance with a Chinese manufacturing company about three years ago, but this year we are formalizing that relationship by establishing a manufacturing operation within their facility," said Bonnie Fena, president of Reptron Manufacturing Services. "We have leased 50,000 square feet, installed production/test equipment and processes identical to that of our facility in Hibbing, MN, and have several on-site managers who directly report to our U.S. operation. This gives us the ability to support customers whose product is best handled domestically within our U.S. operations as well as the ability to support customers who have products more applicable to offshore outsourcing."

Johnson adds that Reptron has very formalized processes for transitioning product offshore. "We make a point of addressing all documentation, process and materials issues prior to transfer, " he said. "We recommend against moving products with high ECO activity or frequent schedule changes. We try to be upfront in discussing the tradeoffs associated with each option, so that our customers have the visibility to make the best choice."

Our global economy provides OEMs with a multitude of choices for manufacturing cost structure. Seasoned outsourcing personnel are always quick to point out that the lowest price is not necessarily the lowest cost, due to the complexity of the outsourcing relationship. While no perfect region for all manufacturing exists, companies can find an area of the world best suited for each project. The key to the optimum solution is to evaluate opportunity costs and trade-offs, as well as the stated costs. ■

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