



TECHNOLOGY FORECASTERS INC.

Information, Insight, Interaction for Effective Manufacturing Relationships

Charting a New Course



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The macro trends of the electronics industry are clear; lower prices, higher performance, mass customization and shorter life-cycles. All of which drives companies to outsource more activities, more often, to more regionally remote geographies than ever before. Doesn't matter if it's a consumer or a commercial product, large volume or small, a significant percentage of global outsourcing is being serviced from China today and will be from some even lower-cost region (India?) tomorrow. But does moving manufacturing to these low cost labor regions automatically mean a lower total cost of ownership?

In the latest version of TFI's research on the true cost of outsourcing (called the Outsourcing Navigator Series or ONS) it's apparent that opportunity exists for OEMs to sharpen their skills at navigating the shoal waters of global outsourcing. This is particularly evident when noting that some OEMs are spending more money today – proportionally – managing outsourcing programs than ever before and in a surprisingly large percentage of cases, OEMs have actually begun losing ground from an economy-of-scale (EOS) perspective.

How Can This Be?

The ONS data clearly illustrates that as outsourcing has become more geographically remote OEMs have too often applied human, financial and administrative resources in response to supply problems because they have not invested in integrated solutions to manage their supply base systemically, i.e. proactively navigating around the hazards before problems developed!

TIME, SPEED AND DISTANCE

These observations are derivative of Total Cost of Ownership (TCO), which by convention is calculated as the sum of recurring plus one-time costs over the life or duration of a project.

In formulation it looks like this:

$$\text{TCO} = \frac{\text{Sum of (Recurring + One Time) Costs}}{\text{Over the life of the project}}$$

The Recurring costs element of this formula includes the direct costs to an OEM for the purchase price of a product, sometime called the FOB price, along with the logistics or landing costs, for items like freight, duty, and transportation fees AND the internal costs at the OEM for:

- Management & Support Personnel
- Plant, Property & Equipment
- Travel & Entertainment
- Training
- Cost of Money

One Time costs, on the other hand, include not only tooling and set-up but also all the “frequently occurring” costs incurred by OEMs internally for items such as:

New Product Introduction:

- Supplier selection and qualification
- Premium and set-up charges

Support interventions on issues like:

- Quality and reliability issues
- Availability challenges
- Engineering-change related activities
- Warranty requirements

The cost of implementing elective programs such:

- Lean Manufacturing
- Six Sigma

As well as industry compliance requirements to items such as:

- RoHS
- WEEE

All in all, a long list of adders to the FOB price paid that collectively drive-up the cost element (top half) of the TCO equation.

Not surprisingly, both the Recurring and so-called One Time costs are impacted by a number of factors, including in order of significance:

1. Scale,
2. Approach, and
3. Complexity of a project.

Starting with Scale, the relationship is pretty straight forward – the bigger the project the lower the cost elements of TCO are on a per unit basis. The classic rules of EOS apply and the characteristic shape of the EOS curve is consistently apparent throughout the OEMs data set.

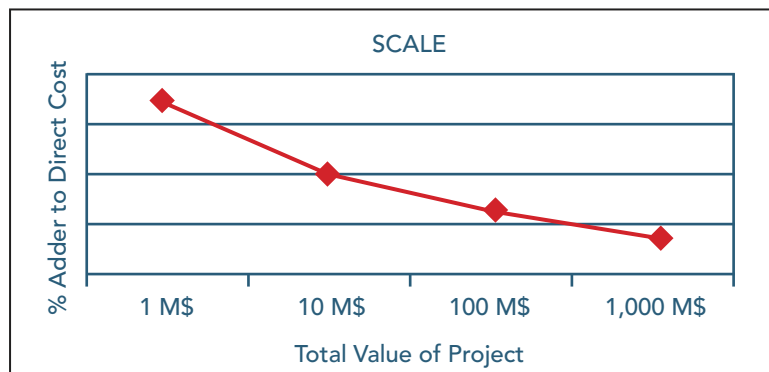


Figure 1 from *Outsourcing Navigator Series Version 10, Revision 2* dated Sept 2006

Approach and Complexity however is not as straight forward a calculation, as each can impact the cost elements of TCO in either a favorable or unfavorable way.

Select certain approaches and the cost elements of TCO go up (unfavorable), select a different approach and the cost elements of TCO go down (favorable). The same is true for levels of complexity; define a lead-time or flexibility variables one way and the cost elements of TCO go up, moderate these requirements and the cost elements of TCO go down. To fully understand these factors it's important to understand what each includes:

Approach includes:

1. Remoteness of the manufacturing geography selected
(Closer is better from a TCO perspective, less travel, per Diem, etc.)
2. The start-up or New Product Introduction (NPI) procedure selected
(Local NPI is much cheaper from a support perspective than remote NPI)
3. Maturity and stability of product design
(Stable designs require fewer Engineering Change Orders)
4. Fulfillment process for warranty
(Simple solutions reduce the risk of a service catastrophe)

Complexity includes:

1. Average lot size and mix
(Larger lot sizes and lower mix requires much less intervention)
2. Lead-time and flexibility
(Short lead-times and high flexibility levels can create chaos)
3. Technology or end-product sector specific requirements
(Medical products for example have special documentation requirements)

Remember TCO costs aren't charges from the EMS or ODMs companies they're monies OEMs spend internally in support of their own requirements!

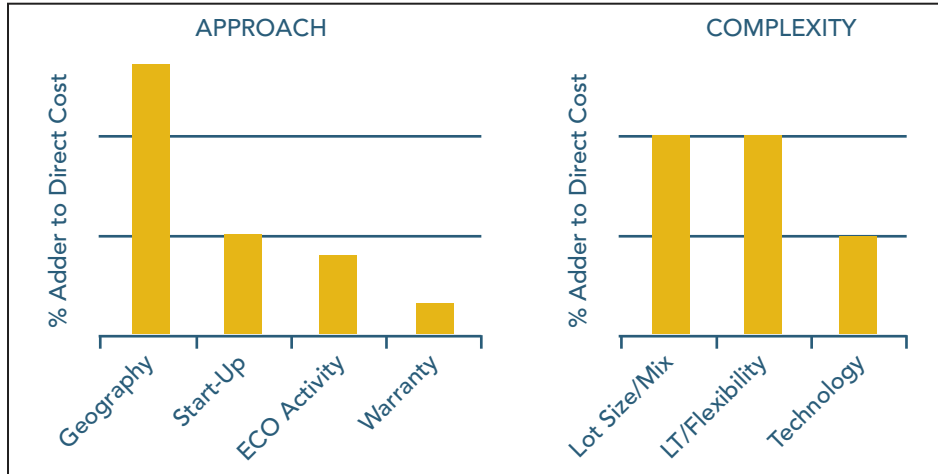


Figure 2 from Outsourcing Navigator Series Version 10, Revision 2 dated Sept 2006

Does this mean TCO dictates that the electronics industry would be more profitable and/or better served by building its' products across the street rather than around the world? No, it doesn't. Just as moving manufacturing to regionally remote, low-cost labor geographies doesn't automatically mean overall costs will go down.

What it does mean, is that the only ways to choose the optimal path is to do the analysis and while the cost of labor is a favorite variable of most OEMs it has historically proven to be a poor predictor of TCO.

COST OF LABOR

Lower labor costs can and usually do favorably impact the cost of materials, but how carefully are these savings weighed against the added costs of operating in regionally remote geographies? Are raw materials, parts, or assemblies sourced from outside the geography shipped trans-continentially in support of labor-savings initiatives?

One of the most enlightening exercises a supply manager can perform is to chart the complete logistical course of the materials contained in their product. More often than not, the results are shocking.

There is no mystery why third-party logistics companies (3PLs) have been one of the fast-growing enterprises since the economic down-turn post Y2K. The electronic industry has extended its' supply-lines by shifting the majority of its' on- and near-shore manufacturing requirements to off-shore solutions. With the result being that too many parts end up traveling more miles than anyone believes possible. Of course it is not just materials that rack-up travel miles.

People travel the same supply-lines as the materials they manage.

The reality of the situation is when a company outsources the design, manufacture, or fulfillment of their product it is too important a task to leave any element of the process to chance – it must be managed and lacking a fully integrated, network based solution much of that management gets done onsite.

But does being onsite always mean that people need to travel halfway around the world?

A practice of almost every OEM Sales organization is to locate their people in close proximity to their customer base. Why do they do this? Because they consider in-geography representation with local knowledge of markets, customers, and regional customs as elemental to the business development and customer support process. But this practice is rarely incorporated by the Operations or Outsourcing groups within OEMs.

When questioned about this disparity, one of three reasons is usually given:

1. The procurement and/or supply-management needs to be located close to the design-engineering function as product development and manufacturing are intertwined processes and therefore are highly co-dependant
2. The skill-set or knowledge base is resident at one location (usually nearby the corporate and/or business-unit headquarters) and the manufacturing is done elsewhere
3. It is more efficient to keep supply management resources closely aligned as they're highly leveraged within the organization

All well thought out, seemingly rational explanations. Yet, perhaps there is a fourth reason that's even more compelling, as in the vast majority of cases "locally" is where these resource existed before the decision was made to move outsourcing off-shore and it's where (by virtue of the status-quo) these resources have remained.

As with our other questions on TCO, does this reality dictate that the electronics industry would be more profitable and/or better served by moving its' Operational support activities to the regionally remote, low-cost labor geography where its' products are being built? No, it doesn't. Just as selecting those geographies in the first place did not automatically mean that overall costs would go down – which in many cases they have not.

As was concluded earlier, the only ways to choose the optimal path is to do the analysis.

An easy to follow example of how this analysis might work would be to look at the case of a Commodity Engineer, currently located at the corporate center, who manages a single commodity throughout the enterprise. Whereby:

- If most of the suppliers for that commodity are located in one geographic region – say in Asia – than in-region Operational support might be a financially viable alternative and should be evaluated
- But, should the suppliers be distributed globally – say in North America, Europe, Middle East and Asia – then moving to an in-region strategy doesn't look practical and probably isn't worth pursuing

Simple, straightforward and deeply rooted in common sense. However, in those cases where in-region Operational support doesn't make sense from either a practical (perhaps the Commodity Engineer in the above example posses unique technical skills and is not interested in re-locating to a regionally remote geography) or financial perspective what are the OEMs options?

TRANSPORT KNOWLEDGE NOT PEOPLE

While the author is not an expert at software systems there are a number of commercially available solutions that – when skillfully applied – have been proven to lower TCO. Primarily by transporting knowledge at the relatively low cost and high speed of global network versus transporting people at the relatively low speed and high cost of an airliner.

All of which makes very good sense when considering that just as the Global Positioning System (GPS) provides an automated, high-speed alternative to celestial navigation, today's integrated response management systems provide users real-time information on a broad range of outsourcing issues, including:

- New Product Introduction
- Availability, scheduling or supply interventions
- Demand fluctuations and volatility
- Engineering change related activities
- Initiative implementation, support and/or training
- Warranty process management

And as the average OEM expends >85% of its' internal spend in support of the above listed tasks, the potential for savings looks substantial.

So pull out those old charts and check to see if there isn't a new course to where you're heading – be it by in-region Operational support and/or Network based solutions – just remember to navigate around versus over those shoals!

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