



## Total Cost Models – June 2007

### **Background**

In most cases, manufacturing decisions are centering on the principle of optimizing operational factors related to cost, quality, and delivery (to name a few). Many of these firms use financial models that aggregate their fixed and variable costs into a more general “cost/part” indicator. On the surface, this makes common sense. A firm needs to produce a product for less than the consumer is willing to pay for it. Historically, cost/part was a very efficient metric for firms to monitor current operational effectiveness and generally was considered the proper informational tool for basing operational decisions. But today’s market reality, firms must now use more comprehensive decisions models, such as Total Cost Models, instead of relying on traditional cost/part metrics.

Global markets and global competition has increased the pressure on firms to be more specialized, more innovative and more globally responsive while the costs must continually be reduced. Firms have “outsourced” and “offshored” their operations, sometimes with the singular goal of remaining competitive through minimizing cost/part metrics. Other factors besides cost/part have been overlooked including the “hidden cost” factors.

Simply, hidden costs represent missing or unmeasured factors. Hidden cost factors important to outsourcing and offshoring decisions have been difficult for firms to incorporate (see Sample List). Many outsourcing decisions of U.S. manufacturing based solely on traditional cost/part metrics would have benefited from a more complete Total Cost Model. The search for low wage labor, driven by reliance on the incomplete cost/part metric, continues to plague many U.S. manufacturers.

### **Sample List of Hidden Cost Factors (Ninghu Song, University of Cambridge)**

- Transportation, duty, insurance;
- Cost entailed by inferior quality, such as additional quality inspection, rejection, rework, downtime, scrap, warranties, brand reputation degrading and loss of market share;
- Cost resulting from longer lead time and poor delivery, such as increased inventory, obsolescence, expediting, premium transportation, downtime, loss of sales;
- Overseas supplier training and engineering support expenditure;
- Administrative cost of maintaining relationships with new suppliers;
- Dealing with local government for special policies, constraints or even corruption;
- Cost related with currency fluctuation risk;
- Cost related with Intellectual Property (IP) protection.

## **Call To Action**

Manufacturers have stressed their concern and need for collaborative help in creating, improving and using Total Cost Models for improved longer-term competitive locational manufacturing decisions. These concerns were reinforced at the Supply Chain Integration Workshop sponsored by the National Science and Technology Council's (NSTC) Interagency Working Group (IWG) on Manufacturing Research and Development. NACFAM recommends that a collaborative project to develop, educate, and assist U.S. manufacturers on Total Cost Model principles and solutions is required immediately.

## **Project Elements**

1. General Awareness for using Total Cost Models
2. Identifying the Hidden Cost Considerations
3. Improving Data Accuracy
4. Measuring Risk
5. Qualitative Factor Decision Models
6. Missing Stakeholders

### **1. General Awareness**

- a. Many outsourcing decision makers within firms are not aware of the terms, principles, tools, best practices or solution providers for total cost models. Although the concern surrounding hidden costs of outsourcing and the acknowledgement of needing better decision models has been around for a decade, many outsourcing decision makers still mainly rely on cost/part metrics and are unaware of Total Cost Models.

### **2. Hidden Cost Consideration**

- a. Many outsourcing decision makers need to be able to understand and use more appropriate cost models.

### **3. Improving Data Accuracy**

- a. One of the main difficulties encountered by early practitioners of Total Cost Models has been surrounding the inaccuracy of data. If data can not be trusted, then incorporating more hidden costs in decision models becomes difficult.

### **4. Measuring Risk**

- a. Factors that are more qualitative in nature or measure potential risks are very difficult for individual firms to handle. If risk is to be incorporated into firm decision, then accessible, reliable and common accepted measures are required.

### **5. Qualitative Factors**

- a. Many factors, including team consensus building, are not appropriate for inclusion into complex quantitative models. Most decisions, and the factors that support them, are qualitative in nature. Users friendly and trustworthy qualitative Total Cost Models are required.

### **6. Missing Stakeholders**

- a. Many decisions are made without the inclusion of all stakeholders. Building better models and having better data is 10% of the solution. Using this trusted model and data to help build consensus and to include more stakeholders will drive more effective long-term decisions, solutions, and implementations.