



How to Measure and Reduce Total Cost of Ownership with Make vs Buy





How to Measure and Reduce an OEM's Total Cost of Ownership

Executive Summary

Manufacturers need to record and analyze a myriad of details to truly measure and reduce their total cost of ownership (TCO). This overview describes how best to lower TCO by accurately analyzing costs involved in product design, management and support, and how to use a strategic partner for product outsourcing to achieve the full benefits of shorter time to market, improved product quality and product lifecycle management. It provides a checklist approach to ensure that no critical cost element is overlooked. As an expert in outsourced assembly and integration, GMI Solutions enables the OEM to concentrate on their core competencies while maintaining control of each aspect of the design, manufacturing, and service processes.

Introduction

Original Equipment Manufacturers (OEMs) all over the world face increasing challenges to remain competitive on a global basis. Customers demand more for less with ever greater value, while increased competition from globally based companies' forces lower profit margins, ever-changing technology creates shorter product life cycles, costs of all types are escalating, and resources are stretched thin. This difficult business environment forces companies to re-think their business models and adopt new strategies that will allow them to improve their competitive position while reducing risks.

Elements of Total Cost of Ownership (TCO)

It can be difficult to measure accurately the costs associated with designing, manufacturing and maintaining a total mechanical assembly solution. Difficulties arise because associated costs may cross functional boundaries and often these costs are not accurately measured. It is also difficult for many of these OEMs to capitalize on the efficiencies and cost savings of the global economy for both component supply and direct manufacturing costs.

Three basic elements need to be addressed:

- Direct costs
- Indirect costs
- Risk factors

The primary intent of this document is to help guide you to accurately calculate what makes sense for you and your products.

Direct Costs

Direct costs include elements that are obvious. Invoices directly related to these items make them easy to track, and experience from past product design cycles enables you to estimate their costs prior to new product development. In general, one can say that the direct costs track the logical flow of product introduction, starting with the program and engineering management, proceeding through manufacturing and concluding with quality assurance and scrap.

In the area of direct costs, significant savings can be achieved by economies of scale resulting from product outsourcing—the higher volumes handled by the vendor result in improved efficiencies and greater bargaining power when dealing with component suppliers.

Cost Element	Comments
Program management	<ul style="list-style-type: none">• Coordination, timelines and logistics• Documentation• Action item maintenance
Engineering resources	<ul style="list-style-type: none">• HW/SW design engineering• Systems engineering• Component and system level test engineering• Prototyping• Build instruction development / maintenance• Regulatory compliance• Sustaining engineering• Service requirements (FRU, regression testing, etc.)
Operational resources	<ul style="list-style-type: none">• Global procurement resources• Order processing• Receiving and inspection• Consistency program development and implementation
Manufacturing resources	<ul style="list-style-type: none">• Labor• Materials: Raw, WIP, Finished goods• Inventory turns management• Manufacturing test development• Shipping logistics• ISO certification requirements
Quality resources	<ul style="list-style-type: none">• Process improvements and root cause analysis• Inspections• Data collection and analysis
Scrap and Rework	<ul style="list-style-type: none">• Design errors, reworks and updates• Manufacturing errors• Out-of-warranty repair services and management
Service	<ul style="list-style-type: none">• Warranty repair• Field replacements and upgrades• Technical support• Testing and diagnostics
Capital expense	<ul style="list-style-type: none">• Manufacturing equipment• Design engineering equipment• Manufacturing test equipment• Tooling

Indirect Costs

Costs that are not immediately evident tend to be excluded from the initial decision making process. Additionally, when these costs do get included they may not be calculated correctly. A good example would be the loss of market share caused by being late to market with new technologies.

In the effort to reduce indirect costs, a strategic vendor such as GMI Solutions can add specialized expertise to the mix and can be tasked to ensure these costs are measured, controlled, and reduced. By bringing additional resources to bear on the initial design cycle, the all-important time-to-market can be shortened. Sometimes they can also serve as a consolidated measurement point, collapsing all these costs into a single figure.

Adoption of new technologies can also play a significant role in saving time and money.

Cost Element	Comment
Managing technology	<ul style="list-style-type: none">• Researching current technology building blocks to capture constant change in available technologies• Design for lifecycle requirements• Maintain relationship with technology providers• Assessments regarding feasibility of new technology
Product time to market	<ul style="list-style-type: none">• Each day of product development delays time-to-money• Delays cost market share• Lost opportunity costs
Development cost	<ul style="list-style-type: none">• Can be reduced by vendor's experience and expertise• Manufacturing• Consumed resources focused on non-core activities
Supply chain management	<ul style="list-style-type: none">• Vendor relationship and logistics management• Utilization of global procurement for best possible pricing
Serial tracking and device history records	<ul style="list-style-type: none">• Revision control and tracking• Material change control• Root cause analysis• FDA compliant record keeping and retention
Training	<ul style="list-style-type: none">• Training personnel in new areas:<ul style="list-style-type: none">○ Manufacturing○ Testing○ Support
Sustaining engineering	<ul style="list-style-type: none">• Expertise specific to platform• Value engineering services ensure competitive advantage• Lifecycle management• Legacy support and service for units in the field
Operational focus and flexibility	<ul style="list-style-type: none">• Increase in size is accompanied by a loss in agility• Bureaucracy limits quick and decisive responses• Need to preserve focus on core competencies
Real estate	<ul style="list-style-type: none">• Warehousing and fulfillment facility• Inventory management and stocking for maximum JIT• Vendor can handle logistics of inventory and burden costs

Risk Factors

Risk is an additional cost that is often overlooked or calculated incorrectly. The reasons are that OEMs often face the possibility of changes in areas with which they are not familiar. For example, it would be difficult and costly for a manufacturer of highly specialized equipment to acquire and retain staff with expertise in regulatory compliance for computer electronics. This does not excuse them from the need to comply with these regulations, which are in a constant state of change. Further they are not likely to have personnel with the time to devote to planning a long-term roadmap for the existing off-the-shelf component of their product—an area where the technology can transition at a steady and exaggerated pace. This is disruptive because design stability is a prerequisite for sustained profitability.

Having GMI Solutions as a strategic partner to manage your mechanical assemblies and related Tier 2 suppliers can enable you to contain much of this risk by offloading it to a single source. GMI Solutions can provide the expertise to address these hidden risk factors. The result can often be drastic reductions in material handling costs.

Risk Factor	Comments
Interruption of supply	<ul style="list-style-type: none">• Natural disaster events• Catastrophic supplier facility failure• Global logistics
Tool ownership	<ul style="list-style-type: none">• Risk of lost tooling costs• Non-transferable tooling risks• Tool repair and maintenance
Fluctuations in demand	<ul style="list-style-type: none">• Inventory logistics (over / under stocking)• Lead time oversight• Supplier management; requires management of fluctuations at the source
Labor	<ul style="list-style-type: none">• Managing labor force size• Employment entitlements• Interruptions in labor availability
Material obsolescence	<ul style="list-style-type: none">• Offload material management issues• Roadmap management• Replacement component diligence and validation
Legal issues	<ul style="list-style-type: none">• Liability: Product, personal, regional and regulatory

GMI Solutions - A Virtual Division to OEMs

GMI Solutions goal is to operate as a virtual division of an OEM and provide a “perfect fit” solution that meets the OEM’s specific engineering and manufacturing needs. GMI Solutions value proposition is to not only be a supplier and sell a product but rather a partner that delivers a total system solution that is both efficient and cost effective.

To accomplish this mission our business model focuses on lowering the OEM’s Total Cost of Ownership and positions GMI Solutions as a direct extension of the OEM’s engineering, manufacturing, quality, procurement and service team – all at a global level. The result is a business model where GMI Solutions provides complete end-to-end services over the entire product life cycle. This approach allows an OEM to *focus on its core competencies* and achieve higher ROI for more rapid growth.

How GMI Solutions Reduces on OEM's Total Cost of Ownership

Reduce and control overhead costs

Using GMI Solutions as a virtual division allows the OEM to contain overhead costs by more effectively utilizing direct resources on core functions. From an operational point of view we essentially become a shock absorber that provides the OEM with a lower and consistent fixed cost of operations that is independent of market cycles.

Redirect resources to higher value activities

GMI Solutions business model allows OEMs to redirect company resources toward strategic activities that offer a greater return on investment - activities such as developing application enabling technologies and customer development initiatives. By focusing resources on higher value activities, the OEM is more focused on building a competitive advantage and increasing market share.

Avoid capital expenditures

The production of ever-changing technology means capital investments in equipment and facilities. GMI Solutions can eliminate capital equipment costs and provide the OEM with a more cost-effective solution by simply spreading these costs over many more builds.

Save on manpower and training costs

Utilizing our business model the OEM can better control labor force size and expertise. With GMI Solutions operating as a virtual division the OEM no longer needs to be concerned with training and managing these resources and can enjoy a fixed operational cost regardless of changing economic and workforce conditions.

Improved flexibility

GMI Solutions allows OEMs to be more agile and quickly address changes in market demand and direction. GMI Solutions core competency in building application-specific solutions provides the market knowledge, relationships, strategic partnerships and resources to make rapid and right decisions. The ability and flexibility to make quick changes and scale appropriately can be a distinct competitive advantage.

Focus on core business

Every organization has resource limitations. GMI Solutions helps our OEM partners to redirect their resources, most often human resources, from non-core activities toward activities that serve the end customer and offer the greatest value. People whose energies are currently focused internally can now be focused externally—on the customer.

Leverage the global advantages

It can be a real, time intensive struggle to find the best source for components at a *global* level. GMI Solutions offers the OEM this advantage inherently in our processes. We have a globally directed procurement activity and offer our OEMs the advantages that brings – seamlessly. The same is true for product manufacturing, as GMI Solutions has fully capable ISO 13485 based, wholly owned manufacturing facilities in both North America and Asia.

Summary: GMI Solutions Reduces the OEM's TCO


A partnership with GMI Solutions allows the OEM to concentrate on core competencies, drive down their overall product costs, improve their ability to respond to changing market conditions and make their cost structure more predictable. The end result is a solution that provides the OEM with a *lower total cost of ownership*.

There are several reasons GMI Solutions is able to lower an OEM's total cost of ownership. One of the most basic is GMI Solutions' focus on building for OEMs exclusively - our technical expertise and operational efficiencies assure the OEM our best-in-class performance. Our partners simply call on GMI Solutions to complement their engineering and manufacturing resources to accelerate product time to market – yet never have to worry about surplus personnel at the end of the product design cycle.

In addition, GMI Solutions also provides OEMs with high quality manufacturing and the opportunity to have a complete turnkey solution that is immediately ready to integrate upon delivery. Globally. This allows our OEM partners to reduce the number of costly “touches” they make in the manufacturing process regardless of where the final assembly is shipped. It also provides our partners with a significant competitive advantage – acting as a shock absorber GMI Solutions is able to buffer the OEM against the ups and downs of the market. The OEM benefit is a fixed cost of operations that is independent of these business cycles.

Finally, GMI Solutions eliminates cost surprises and has the means to provide OEMs with end-to-end services across the complete product life cycle. A single invoice source that reduces and controls hidden overhead costs often ignored in calculating TCO. With GMI Solutions the OEM simply redirects internal resources to higher value activities, eliminates supply-chain and material logistics, avoids capital expenditures, saves on manpower and reduces training costs.

Outsourcing Analysis Worksheet

Cost Elements/Comments	OEM Internal	
Engineering resources <ul style="list-style-type: none"> • DFM (Design For Manufacturing) activities • Continuous product improvement / Root Cause analysis • Change management / ECR – ECN • Expertise specific to computing platform • Value engineering services ensure competitive edge • Legacy support and service for units in the field • Quality engineering to support consistency 	\$\$\$	\$
Initial Capital Set-Up Costs <ul style="list-style-type: none"> • Equipment and process development and management • Production line space (globally) • Employee base and managing labor force size • Interruptions in labor availability • Operational activities • Quality / Inspection and procedures 	\$\$\$	\$
Product Demand Fluctuation <ul style="list-style-type: none"> • Demands – even / up / down • Weekends / overtime / additional shifts • Supporting plant speed • Assembly • Preventative Maintenance / auditing / training 	\$\$\$	\$
OEM direct facility shift from make to buy <ul style="list-style-type: none"> • Factory overhead – existing or new (improvements) • Manufacturing and non-manufacturing costs <ul style="list-style-type: none"> ○ GAAP, SG&A 	\$\$	\$
Inventory management and stocking <ul style="list-style-type: none"> • Processing • Logistics – incoming freight • Packaging • Safety stock in USA • Bi-weekly shipments 	\$\$\$	\$
Partial build/subassembly <ul style="list-style-type: none"> • GMI could perform 90% - purchase final 10% • Kitting / test / logistics of made and purchased parts 	\$	\$
Global manufacturing and logistics, including China <ul style="list-style-type: none"> • In-region manufacturing • Qualified global vendor base • Granite-managed labor force 	\$\$	\$
Costs / risk associated key: \$\$\$=Most \$\$=Midrange \$=Minimal		

GMI Solutions TCO Overview r240925



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