



TCO

Total Cost of Ownership



Electronic Manufacturing Services

VEXOS

Local Service. Global Capabilities.

Understanding Total Cost of Ownership in the Electronics Manufacturing Service World

The total cost of ownership (TCO) is a financial estimate intended to help buyers and owners determine a product or service's direct and indirect costs. In the EMS industry, TCO refers to the overall costs factors associated with developing the product/project from the design stage to the product launch stage.

While EMS manufacturing is one of the critical stages of the overall product lifecycle, one should decide regarding owning the responsibility of manufacturing it in-house vis-a vis outsourcing it after critically evaluating overall costs and factors. Decisions based solely on the price factor often lead to an understatement of about **20-30%** of the overall costs.

Various parameters associated with EMS/PCB manufacturing which should be analyzed are:

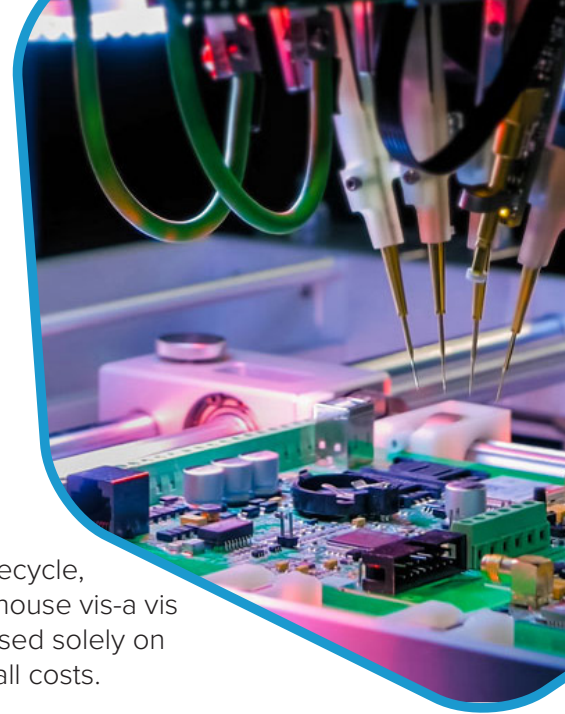
- Capital (Machines/ Space/ Technology)
- HR (Hiring/ Sourcing/ Training/ Retaining)
- Time
- Warehousing and Logistics
- Fuel/ Freight/ Duties
- IP
- Flexibility/ Understandability
- Uncertainties (Pandemic/ Natural disaster/ Stockouts/ Political risks/ Currency fluctuations)
- Environmental factors (Sustainability/ Carbon footprints)

One should factor in all cost elements before finalizing a decision. If the in-house production cost is **5-10%** more than the cost of outsourcing, one should go ahead with in-house production. Whereas, if the costs are **30%** or more, one should consider outsourcing the jobs to the Electronics Manufacturing Services (EMS) expert.

Many companies do a fair job of understanding the six fundamental cost factors when reviewing quote options with prospective suppliers. These reviews typically include the following as noted in the below table.

Total Cost of Ownership - Six Fundamental Cost Factors	
1	Cost of Goods Sold (COGS) Typically reviewed
2	Ex-works Factory Unit Cost
3	Freight and Logistics Cost to Ship to Location Air Freight versus Ocean Freight
4	Applicable Duty %
5	Initial Tooling and or Capital Equipment Costs
6	Payment Terms

What is typically not considered are all the other factors that are equally important, but far more difficult to quantitatively analyze during a source selection process. Every company has its own unique set of contributing factors that will vary from organization to organization. It would not be appropriate to assume that the one size fits all approach to find TCO cost drivers should be considered before making a sourcing decision. Each of these with the supplier under consideration could be viewed as either beneficial or negative depending on the situation. The intent is to denote these variables for your sourcing consideration, prior to selecting a new supplier of choice.



ELEMENTS	ASSOCIATED VARIABLES					
Operation Cost	Labor Saving		Assembly Cost		Capacity	
Quality	Cost of Quality	Scrap	Customer Returns	Unplanned Downtime	Rework	
Logistics	Lead Time		Supplier Managed Inventory		Warehousing	
Technological Advantage	Flexibility for New Use Technology		Long-Term Advantage		Supplier Ability to Change Technology	
Supplier Reliability and Capability	Partnering Cost	Trust	Supplier Capabilities	Suppliers R&D Capability	Supplier Ability to Grow	Supplier Support
Inventory Cost	Safety Stock			Storage		
Life Cycle	Project Life Cycle	Life of Product	Cost Saving Over Life of Product		Redesign Cost	
Transaction Cost	Supplier Conversion Cost					
Initial Price	Long-Term Price Stability			Initial Capital Expenditure		
Opportunity Cost	Cost of Money			Overhead		

As a suggestion, it may be appropriate to pick the elements that are applicable to your organization and then develop a simple quantitative grading scale from 1-5 for each of the elements. This could provide a summary for each supplier under consideration. The higher the individual value, the better positioned the supplier is on the given element. Once done, you could sum the total value of all the elements to see which supplier is best aligned with your important supplier requirements and expectations.

Whereas, if one considers outsourcing the jobs offshore, to a different continent, they should also consider additional variables such as transit time, lead time, order management and fulfillment flexibility, fuel cost, freight duties, shipping costs and impact on the environment leading to increased carbon footprint. The strategic partner should allow the customer to focus on building and managing the design of the product and help the organization to deliver the same in the market. Ultimately, these factors combine to give you full control over TCO improvement year after year.

For more information on Total Cost of Ownership Contact VEXOS today!
Info@vexos.com

ABOUT VEXOS Inc., Operating in several locations across North America and Asia, VEXOS is a high-mix, high complexity, mid to low electronics manufacturing and custom material solutions provider with a proven track record of delivering high quality, custom-designed electronics manufacturing services and supply chain solutions to a diverse group of OEMs. Vexos' early involvement in the design cycle can provide customers with a product that is more cost-effective and has increased manufacturability, quality, and reliability through its entire lifecycle. During their involvement in design reviews, they focus on key areas throughout the cycle and provide critical feedback to address potential issues and ensure a successful new product introduction. Design reviews can also be categorized by material (Design for Supply Chain), test (Design for Testability), PCB fabrication (Design for Fabrication), assembly (Design for Assembly) and manufacturing (Design for Manufacturing). VEXOS prides itself in working closely with their prospective and current customers to ensure that they offer value that far exceeds the six fundamental cost drivers of a supplier-customer relationship.

Contact Vexos: Info@vexos.com

To learn more please visit about Vexos at www.vexos.com



Dependable Quality

Vexos achieves the highest quality levels by utilizing the latest equipment, processes, quality standards and certifications across the organization; to enable a flawless launch of each individual program.

- Rigorous selection of sub-contractors or partner factories
- Performance evaluation and monitoring through regular audits of the factories
- Continuous training for personnel at all levels
- Document control to safeguard your data and release of technical documents
- Sample approval process including production part approval process (PPAP)

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- ISO 13485:2016
- ISO 14001:2015
- FDA registered
- OHSAS 18001:2007
- RoHS and Non-RoHS
- IATF 16949:2016
- CGP certification

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