

## Executive Summary

Original Equipment Manufacturers (OEMs) around the world face increasing challenges and global competitiveness. Customers are demanding more solutions that offer greater value, increased competition is affecting profit margins, ever-changing technology results in shorter product lifecycles, costs are escalating, and human resources are being asked to do more with less. In this challenging business environment, many companies are reconsidering their business models and adopting new strategies to improve their competitive position and reduce their risks.

OEMs need to assess many factors in order to measure and reduce total cost of ownership (TCO) for appliance and embedded computing solutions. These costs are associated with product design, manufacturing, and support, and can be categorized as:

- Direct costs
- Indirect costs
- Risk factors

The mission of Network Allies is to operate as a “virtual division” of our OEM customers and deliver a turnkey appliance or embedded computing solution that meets the OEM’s specific engineering and manufacturing needs. To accomplish this mission, Network Allies focuses on being a strategic partner and lowering the OEM’s TCO over the entire product lifecycle by:

- Reducing and controlling overhead costs
- Focusing resources on core competencies
- Eliminating capital expenditures
- Saving on manpower and training costs
- Increasing flexibility and agility

Network Allies partners with OEMs to develop purpose-built systems - integrated software and hardware solutions - that are customized and optimized for the specific needs of their customers or industry and reduce their TCO. We provide a complete set of computing system development capabilities, from prototyping to full production, inventory and supply chain management, global logistics, and program management.

# Components of Total Cost of Ownership

The total costs associated with designing, manufacturing, and maintaining a turnkey appliance or embedded computing solution are not readily apparent because some of these costs are not obvious or easy to calculate. The components of TCO are direct costs, indirect costs and risk factors.

## Direct Costs

Direct costs are obvious expenses, and follow the product lifecycle from engineering, through manufacturing, to quality assurance and end of life, as shown in the following table. Invoices directly related to these costs make them easier to track, and past experience enables accurate estimates of these costs prior to new product introduction. Significant savings in direct costs can be achieved by the economies of scale resulting from outsourcing - higher production volumes generated by a strategic partner like Network Allies result in improved efficiencies and greater bargaining power with component suppliers.

Direct Costs	Include
Program management	<ul style="list-style-type: none"> <li>• Coordination and logistics</li> <li>• Documentation</li> <li>• Action item maintenance</li> </ul>
Engineering resources	<ul style="list-style-type: none"> <li>• Hardware and software design engineering</li> <li>• Systems engineering</li> <li>• Test engineering</li> <li>• Prototyping</li> <li>• Build instruction development and maintenance</li> <li>• Regulatory compliance</li> <li>• Sustaining engineering</li> </ul>
Operational resources	<ul style="list-style-type: none"> <li>• Procurement resources</li> <li>• Order processing</li> <li>• Receiving and inspection</li> <li>• Consistent program development and implementation</li> </ul>
Manufacturing resources	<ul style="list-style-type: none"> <li>• Labor</li> <li>• Materials: raw, work in progress, finished goods</li> <li>• Inventory turns</li> <li>• Manufacturing test</li> <li>• Shipping logistics</li> <li>• ISO 9001 certification</li> </ul>
Quality control	<ul style="list-style-type: none"> <li>• Process improvements</li> <li>• Inspection</li> <li>• Data collection and analysis</li> </ul>
Quality assurance	<ul style="list-style-type: none"> <li>• Infant Mortality fallout</li> <li>• Design errors</li> <li>• Manufacturing errors</li> </ul>
Service	<ul style="list-style-type: none"> <li>• Warranty repair</li> <li>• Field replacements and upgrades</li> <li>• Technical support</li> <li>• Test and diagnostics</li> </ul>
Capital expenditures	<ul style="list-style-type: none"> <li>• Manufacturing equipment</li> <li>• Design engineering equipment</li> <li>• Manufacturing test equipment</li> </ul>

## Indirect Costs

Indirect costs, as shown in the following table, are not as obvious and tend to be excluded from the decision-making process. For example, the opportunity cost caused by being late to an emerging market is often not included in the TCO. When indirect costs are included, they are often not calculated correctly.

With indirect costs, a strategic partner such as Network Allies can add specialized expertise and streamline the production process to reduce these costs. By involving additional resources in the new product introduction process, the critical time-to-market can be shortened and the OEM can engage in higher-value activities.

Indirect Costs	Include
Managing technology	<ul style="list-style-type: none"><li>• Researching current technologies for evolving change</li><li>• Maintaining relationships with technology providers</li><li>• Assessing feasibility of new technologies</li></ul>
Product time to market	<ul style="list-style-type: none"><li>• Recognition that each day of product development delays time to revenue and potential market share</li><li>• Lost opportunity costs</li></ul>
Development costs	<ul style="list-style-type: none"><li>• Savings based on vendor experience and expertise</li><li>• Reduced resources focused on non-core activities</li></ul>
Supply chain management	<ul style="list-style-type: none"><li>• Vendor relationship and logistics management</li></ul>
Serial tracking for complete records	<ul style="list-style-type: none"><li>• Revision control and tracking</li><li>• Material change control</li><li>• Root cause analysis</li></ul>
Training	<ul style="list-style-type: none"><li>• Training personnel in new areas: manufacturing, testing and support</li></ul>
Sustaining engineering	<ul style="list-style-type: none"><li>• Expertise for specific computing platforms</li><li>• Value engineering services that provide a competitive edge</li><li>• Legacy support and service for units in the field</li></ul>
Operational focus and flexibility	<ul style="list-style-type: none"><li>• Agility from a smaller organization versus increased resources</li><li>• Increase or reduction in bureaucracy that affects responsive decision making</li><li>• Focus on core competencies</li></ul>
Real estate	<ul style="list-style-type: none"><li>• Warehousing and fulfillment facility</li><li>• Inventory and burden costs</li></ul>

## Risk Factors

Risk is an additional cost that is often overlooked or calculated incorrectly because the OEM often faces the possibility of changes outside its areas of expertise. For example, it would be challenging and costly for a Medical Device manufacturer to acquire and retain staff with expertise in ever-changing regulatory compliance for embedded computer electronics. Neither is the OEM likely to have staff with the expertise to plan a long-term roadmap for the computing component of the product - where technology end-of-life is a major factor - even though reliability is a prerequisite for success in the marketplace. Working with a strategic partner such as Network Allies can help identify, manage, and contain this risk, resulting in reductions in costs associated with materials obsolescence and production interruptions.

Risk Factors	Include
Fluctuations in demand	<ul style="list-style-type: none"><li>• Inventory logistics: over and under stocking</li><li>• Lead-time oversight</li><li>• Supplier management, including management of fluctuations at the source</li></ul>
Labor	<ul style="list-style-type: none"><li>• Managing labor force size</li><li>• Employment entitlements</li><li>• Interruptions in labor availability</li></ul>
Materials obsolescence	<ul style="list-style-type: none"><li>• Materials management issues</li><li>• Roadmap management</li></ul>
Legal issues	<ul style="list-style-type: none"><li>• Liability: product, personnel, regional, and regulatory</li></ul>

## Reducing Total Cost of Ownership

The mission of Network Allies is to operate as a “virtual division” of our OEM customers and deliver a turnkey appliance or embedded computing solution that meets the OEM’s specific engineering and manufacturing needs. To accomplish this mission, Network Allies focuses on being a strategic partner and lowering the OEM’s TCO over the entire product lifecycle. As a direct extension of the OEM’s engineering, manufacturing, quality, procurement and service functions, we provide complete end-to-end capabilities. Consequently, the OEM is able to focus on its core competencies and achieve higher profitability and more rapid growth.

**Reducing and controlling overhead costs** - As a virtual division, Network Allies allows the OEM to contain overhead costs. From an operations standpoint, Network Allies absorbs the shocks of market demand fluctuations and provides the OEM with lower and consistent overhead costs that are independent of market cycles.

**Focusing resources on core competencies** - Network Allies allows OEMs to redirect company resources toward their core competencies – the higher-value activities that offer a greater return on investment such as developing application-specific technologies and customer retention and development initiatives. By focusing resources on its core competencies, the OEM builds a competitive advantage and increases market share.

**Eliminating capital expenditures** - The production of ever-changing appliance and embedded computing solutions requires capital investments in equipment and facilities. Network Allies eliminates these capital equipment expenditures and provides the OEM with a more cost-effective solution by distributing these costs over many more production units.

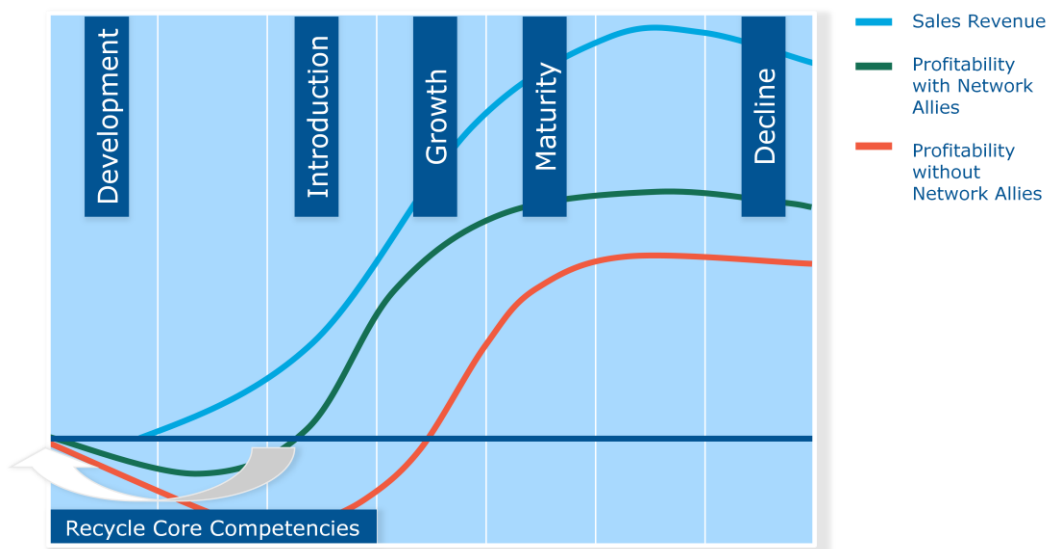
**Saving on manpower and training costs** - Utilizing Network Allies, the OEM more effectively manages labor force size and skills. With Network Allies operating as a virtual division, the OEM is no longer responsible for training and supervising these specialized employees, and is in a better position to control labor costs regardless of changing economic conditions.

**Increasing flexibility and agility** - Network Allies allows OEMs to be more agile and rapidly address changes in market demand and direction. Our core competency in building turnkey appliance and embedded computing solutions provides the OEM with key resources to make quick and appropriate adjustments. The ability and flexibility to make adjustments and scale accordingly is a distinct competitive advantage.

## Conclusion

A partnership with Network Allies allows our OEM customers to concentrate on core competencies, reduce production costs, respond better to changing market conditions, and establish a more predictable cost structure. The combination of our customer's vertical market and application knowledge with our computing system development expertise, including integration, testing, manufacturing, supply chain management, and program management, results in appliance and embedded computing solutions at a faster and more efficient time-to-market, reducing TCO and leveraging the OEM's core competencies.

The diagram below illustrates how Network Allies lowers TCO and increases the profitability of our OEM customers over the entire product lifecycle.



## About Network Allies

Network Allies was founded in 2002 on the principles of partnership and leading-edge technology. We believe in teaming with our customers and technology partners to deliver innovative technology solutions, leveraging our strengths in design, production and support with the strengths of our customers and partners in industry-specific hardware and software applications.

To learn more about Network Allies, visit [www.networkallies.com](http://www.networkallies.com). Or, contact us at (978) 486-0300 or [info@networkallies.com](mailto:info@networkallies.com).

© Copyright 2012 Network Allies, LLC. The information contained herein is subject to change without notice. The only warranties for Network Allies products and services are set forth in the express warranty statements accompanying such products and services. Nothing herein should be construed as constituting an additional warranty. Network Allies shall not be liable for technical or editorial errors or omissions.