

KEHP Group

White Paper

The Top 10 Hidden Costs Experienced by Most Embedded Systems (OEM) Businesses

How HP and Bell Micro Help OEM Teams Overcome Hidden Cost Challenges

Sponsored by: Bell Micro

Abstract: Embedded systems organizations are in the process of transforming their operations from working with custom mother board design and manufacture, to building on white box and brand-name equipment. As embedded systems teams go through this transformation, there are hidden costs to consider – hidden costs which can make or break their businesses. In this paper, KEHP Group reports on the top 10 hidden costs experienced by typical embedded systems teams and explains how HP and Bell Microproducts help to overcome these challenges.

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Executive Summary

Systems price is not the best predictor of OEM cost. Instead, the impact of technology components and the technology manufacturing process on operational costs and overhead determines cost outcomes for OEM businesses. Working with market leading HP equipment as made available from Bell Micro with supporting OEM-Ready programs can help to lower costs and increase competitiveness for embedded systems businesses.

Return on Investment (ROI) value and cost estimates can be best quantified using weighted estimates in key operational categories. The practice of asking relevant questions about the operational overhead experienced in each category can be helpful to this process. Bell Micro OEM specialists are available to assist OEM teams in conducting an ROI analysis, to support their transformation from custom mother board use to white box and branded components as the basis for their solutions and services offerings.

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The Myth of Better Pricing

Many times, organizations acquiring computer equipment and storage devices consider price as a primary consideration in the purchase process. Organizations have shrinking budgets, and need to spend their money wisely. Makes sense – as far as it goes. Unfortunately, however, there are hidden traps in this approach.

What are the traps? The unfortunate truth is that many systems and storage devices which appear to be the most cost-effective in terms of price can cost organizations substantially more money over time than what may appear to be more expensive alternatives. In plain language, cheaper is not always better.

This paper examines the hidden costs that are critical for OEM businesses to consider in their process of evaluating, selecting and acquiring computer servers, storage, intelligent networking, workstations and other devices. We also consider how hidden costs affect the relative value of popular OEM options for embedded systems manufacturers, including the costs of custom mother board design, white box, and leading branded systems.

Some of the hidden costs which can be overlooked at time of acquisition include: on-going cost overheads from component and service quality; global distribution and support costs; costs which come from managing the supply chain and manufacturing process, including design and engineering, inventory management, reporting and forecasting, third-party component integration, meeting certification requirements, and lifecycle management; and, finally, there are opportunity costs associated with potential services resale, component availability and lead times, and brand and solutions marketing.

As this applies to an Original Equipment Manufacturer (OEM) purchase, the stakes in finding the hidden costs of acquisition are extremely high. The hidden costs can literally make or break an OEM business.

ROI Methodology

KEHP Group was commissioned by Bell Microproducts in the Spring of 2008 to evaluate the ROI value of the HP systems and equipment being offered to Bell Micro OEM customers. This paper is the result of that activity. It is notable that Bell Micro offers alternatives to HP systems and equipment as part of its OEM practice.

ROI evaluation is a critical discipline to understanding the actual value of any computer system or technology. KEHP's ROI Methodology 1) identifies potential time, cost and opportunity cost areas, 2) interviews key stakeholders, and 3) builds a model that incorporates stakeholder feedback around the most impactful ROI areas. This model is continually tested and revised over time for both usefulness and accuracy. This methodology contributed both to this paper and to the associated Build OEM Better ROI Estimator tool.

Top 10 Hidden Costs to OEM Businesses | 2008

Table 1: Top 10 Hidden Costs Critical to Embedded Systems Manufacturers

Category	Top 10 Hidden Costs	How HP and Bell Micro Lower the Costs
Equipment and Service Quality	<i>Component Quality and Manufacturing Consistency</i>	<i>Highest initial quality, longest mean-time between failures, world-class quality standards in manufacturing</i>
	<i>Service and Support, and the Break-Fix Cycle</i>	<i>Technical knowledge, 24x7 service availability and time to resolution</i>
	<i>Breadth of Offering; Single-Source Acquisition</i>	<i>Maximum capabilities with common support and built-in interoperability; Minimum number of contracts and vendor relationships to manage</i>
	<i>Global Business Assistance</i>	<i>Worldwide parts availability and service team presence, global certifications and brand value</i>
	<i>Solutions Differentiation</i>	<i>Build on HP solutions brand value, quality and operational (power/cooling) efficiency to add competitive value to any OEM solution</i>
Supply Chain Management and Manufacturing	<i>Inventory Management, Reporting and Forecasting</i>	<i>Ease of doing OEM business is a priority, with logistics assistance and returns flexibility</i>
	<i>Design and Engineering</i>	<i>Authorized, Third-Party Component Integration</i>
	<i>Lifecycle Management</i>	<i>Help with advanced EOL notification, parts replacement and retirement</i>
Opportunity Costs	<i>Services Resale</i>	<i>Opportunity to resell HP Care Pack services is another potential revenue source</i>
	<i>Lead Time and Availability</i>	<i>Component availability and lead times can make or break an opportunity</i>

What are the Critical Hidden Costs for OEM to Consider?

KEHP Group worked with Bell Micro service teams and OEM customers to identify several key categories of hidden OEM equipment costs. There are costs associated with the quality of the equipment and technology itself, and from their on-going operation. There are costs associated with obtaining the equipment and managing its supply chain. Finally, there are what can be termed opportunity costs associated with added value and revenue from working with branded products and services.

Within each category, there are several top hidden costs to consider in the OEM acquisition process.

Equipment Quality: Impacts of Quality on Service and Support Costs and the Break-Fix Cycle

The quality of the equipment components selected by OEM businesses have an obvious and direct affect on the quality of the solution or service which they, in turn, are able to offer to their end-user customers. Consistency of the quality produced by the manufacturing process is an additional key consideration, and one with tremendous cost implications to OEM teams when consistency cannot be maintained. Component quality can also impact on-going service and support costs for the OEM team.

Key requirements in selecting OEM equipment must include the consistency of quality delivered, the mean time between component failures, and the process for obtaining replacement parts when required in the field. If any part of this quality chain breaks down, then OEM team resources are delayed from pursuing new business opportunities and are distracted by fixing costly problems. Not only do OEM costs go up, but end-user customer satisfaction goes down, threatening new business opportunities including follow-on sales, renewals and references.

The net conclusion of KEHP Group analysts in considering component quality, is that selecting components from vendors with a proven track record of delivering consistently high quality is critical for OEM teams. Considering services availability, technical proficiency, time to resolution and overall customer satisfaction in addition to technology quality is also essential.

Breadth of Equipment Offering: The Hidden Cost of Having Too Few Technology Options

For embedded systems teams transforming their businesses from custom mother boards, the only key requirement may appear to be to obtain sufficient mother board processing power at a low enough price point. However, having access to a broader set of OEM-Ready technologies

Hidden Cost Factoid: It will soon cost more to power and cool a server over its lifetime than it costs to acquire the server.**

**According to studies reported by HP

can bring compelling advantages. Said another way, a narrow technology set can bring limitations, roadblocks and ultimately raise the costs for an OEM business.

In addition to ensuring a broad-enough set of server types to support the OEM business – “now” and into the foreseeable future – an OEM team should consider additional types of related computing technologies. A broad-enough OEM portfolio can be evaluated on the availability of any and all of the following:

- Server systems – including rack, tower and blade server options
- Blade systems – including enclosures, servers, storage, and LAN and SAN integrated back planes
- Storage systems – including tape drives, server storage, NAS, and external LAN- and SAN-attached systems
- Networking systems – including intelligent switches, security and mobile computing access
- Workstations – including Windows, Linux and UNIX workstation options
- Services – including global availability, 24x7 access, and within-4-hour break-fix service options

Although each of these components can be sourced from independent vendors, the ROI benefits of obtaining them from a single vendor can be high. Instead of having to negotiate and manage multiple purchase contracts with multiple service agreements, combining these purchases can reduce overhead and lower costs. Also, when equipment needs to be combined into a single OEM solution, single-source acquisition can simplify and even eliminate integration requirements from the manufacturing process. Troubleshooting and break-fix complexities can also be reduced, further lowering costs.

As the number of technologies included in an OEM contract increases, the ways in which that OEM qualifies for better pricing, support and services likewise typically increases. This is another often hidden value in finding broad-enough OEM portfolios to support an OEM business.

The net conclusion of KEHP Group analysts on considering a broad-enough OEM portfolio, is that each OEM team will need to judge the meaning of “broad-enough” for themselves as it applies to their particular business. Thinking ahead to consider potential expansions in business opportunities and OEM requirements is critical. Combining as many technology acquisitions together into the same single-source contract provides cost-savings efficiencies that reduce the hidden costs associated with selecting, negotiating and managing multiple vendor relationships over time.

Global Business Assistance: Global Considerations to the Hidden Cost Equation

Global service and support presence should be considered as a priority by any OEM organization doing business internationally, or who intends to expand the growth of their business into emerging markets such as Brazil, India and China. Moreover, parts availability, local shipment and procurement options are factors affecting risks, costs, and service response times for international businesses.

Beyond service and support, building on a solution with global brand recognition and a high quality reputation can encourage solution adoption and acceptance in new markets and territories. Working with components that come with global certifications also help to ensure faster acceptance with lower costs to OEM business operations.

Inventory Management: Gaining Distributor Assistance Can Simplify Hidden Costs Associated with Parts Availability and Lead-Times

A challenge of working with a large systems vendor can be the overhead and cost of managing the supply chain. Managing the availability of required components, the cost to warehouse spare parts and advanced inventory to ensure manufacturing schedules, and planning for the lead times necessary to receive new and updated components can add significantly to the cost overhead for an OEM business. This is especially true for small-to-medium OEM businesses who cannot commit to high enough revenue levels to enjoy focused attention from a large systems team.

When solutions evolve, an OEM-Ready distributor can enable rapid design change implementations by enabling inventory swaps. The distributor can readily offer the exchanged components to other partners, because of its wider market coverage, while still meeting sales objectives and commitments required by the systems vendor.

Another requirement of large systems manufacturers is a reporting and forecasting process, which can include advanced sales commitments. Depending on the size and funding of the OEM organization, this type of advanced sales commitment can have a significant negative impact on cash flow over time. Flexibility in terms of ordering, forecasting and fulfillment is essential and should be factored into the cost-benefit equation.

Design and Engineering: Gaining Authorized Assistance with Third-Party Integration to Lower Costs

Often, OEM teams need the capability to offer custom configurations to their end-user customers. However, they are often on their own to design, test, re-design and troubleshoot a custom configuration – adding cost in the process. Third-party certifications are sometimes also a priority – and can be a requirement – for the OEM solution to be sold into end-user customer environments. In many cases, custom changes are not possible because they can invalidate the product warranties.

Engineering overhead, testing, and certifications are additional hidden costs that should be factored into the overall evaluation of any OEM solution. When simplifying the manufacturing process is a priority, then working with providers that can assist with design and engineering can provide a valuable competitive assist.

Lifecycle Management: Hidden Costs in Managing OEM Components through End of Life

When vendors End of Life (EOL) an embedded component, the cost to the OEM organization can be large. OEM teams must consider the implications of the manner in which their selected technology providers manage technology products through their entire lifecycle, along with available mechanisms for advanced communication of EOL.

Equipment Efficiency: The Hidden Cost of Power and Cooling Consumption to an OEM Business

The hidden costs of power and cooling consumption and the closely related concerns with floor space consumption are bigger factors for end-user customers than for OEM organizations. However, the impact to OEM businesses can be large when the impacts to overall system design, competitiveness of the resulting solution, and the opportunity costs associated with end-user budget allocation are considered.

Hidden Cost Factoid: It will soon cost more to power and cool a server over its lifetime than it costs to acquire the server.**

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As the “green IT” movement matures and becomes an expected standard for doing business, failure to meet minimum standards for energy efficiency could prevent an OEM solution from being considered for purchase. Conversely, meeting and exceeding those standards – with proven EPEAT Gold and Energy Star efficiency ratings built in as part of the solution – can help differentiate an OEM solution and improve its competitiveness. Branded components can help to promote these efficiencies and add “pull” to the OEM solution.

In addition to ensuring that components are energy efficient for their type, there are also advantages to being able to select and build on system types which have inherently better efficiencies. Blade technologies, for example, offer better efficiencies in consolidation (floor space) and energy consumption than equivalent rack and tower systems. As reported by the independent industry firm IDC, *“total cost of ownership (TCO) analyses favor blade server systems over rack-optimized server systems for reductions in both capital and operating expenses.”***

Specific HP BladeSystem cost-savings efficiencies cited by IDC upon examination of data provided by HP, include:

- **Reduced Capex:** hundreds of independent rack servers require thousands of independent parts including LAN and SAN components; the BladeSystem with its integrated backplane for consolidated LAN and SAN access requires far fewer interconnecting cables and devices
- **Reduced Opex:** reductions in power, cooling and datacenter space accumulate to lower facilities costs by an estimated 25%; new server deployment is simplified from a few hours per server to a few minutes per blade

**For the full IDC report and its findings on the efficiencies of HP BladeSystem technology, see: <ftp://ftp.compaq.com/pub/products/servers/blades/idc-tco-deployment.pdf>

The net conclusion of KEHP Group analysts as it applies to OEM business teams, is that working with a vendor providing proven and comprehensive blade technologies in addition to other server types (rack and tower models) offers unique and compelling advantages to reduce hidden costs for end-users: a compelling value proposition to offer to end-user customers. Moreover, working with a vendor such as HP that builds in energy-efficient technology innovation across the majority of its product offering can add competitiveness to the OEM solution.

How to Estimate the Hidden Cost Impact

As always, attempting to objectify hidden costs and calculate exact Return On Investment (ROI) and Total Cost figures is extremely difficult. The complexity derives from the extreme variability of the environments and configurations in which equipment is used, and the business problems to which computing is applied.

In attempting to derive real cost figures to apply to OEM businesses, KEHP Group analysts first determined to identify and examine typical OEM operational categories which caused high cost either because of their frequency of occurrence, or their critical nature to supporting the business. Once this was done, it was determine that in general a percentage of the cost of acquiring the equipment could be assigned to each critical operational process. The exact percentage was not as important as the approximate relative weight of each cost area. By considering the relative average weight, KEHP Group was able to derive a top-down list of the most critical cost categories that any OEM should consider in the acquisition process.

Table 2. Relative Weighting of the Top 10 Hidden Cost Areas Critical for OEM Consideration

	<i>Hidden Cost Area</i>	<i>Weighting (as a percentage of acquisition cost)</i>
1	<i>Component, Service & Support Quality</i>	<i>10-20%</i>
2	<i>Global Operations & Availability</i>	<i>5-10%</i>
3	<i>Engineering, Design & Certification</i>	<i>1-5%</i>
4	<i>Single-Source Acquisition</i>	<i>1-5%</i>
5	<i>Brand, Quality, Power/Cooling Efficiency</i>	<i>1-5%</i>
6	<i>Configuration, Logistic, Inventory Services</i>	<i>7-9%</i>
7	<i>Manufacturing, Integration & Assembly</i>	<i>5-10%</i>
8	<i>Test, Certification, Warranty, Change and EOL Management</i>	<i>5-10%</i>
9	<i>Lead-Time and On-Time Delivery</i>	<i>5-100%</i>
10	<i>Services Resale (lost revenue @ cost)</i>	<i>5-30%</i>

OEM teams can judge for themselves their experience with current OEM components including custom mother boards, when evaluating the expected hidden costs when working with white box and branded systems components. Asking a series of key questions for each cost area is critical to the evaluation process.

The KEHP Group has developed an ROI Estimator tool to assist OEM teams in evaluating the hidden costs of systems components on their business operations. The tool uses the experience of real customers working with HP equipment as a baseline for calculating ROI estimates, and also enables easy custom entry of cost estimates that match the experiences of a particular OEM team. This tool is available working with the Bell Micro OEM-Ready specialists, who can walk OEM teams through the use of the ROI Estimator tool.

Market Leadership Factoid:

HP ProLiant servers have enjoyed 46 consecutive quarters of market leadership**, reflecting unmatched product quality and customer acceptance.

**As reported by IDC Server Tracker May 2008

HP Technology Delivers on ROI Value by Avoiding Hidden Costs

Bell Micro provides OEM access to market-leading HP servers, networking, storage and workstation equipment. OEM customers can select from a broad range of HP technology, all of which meet the product quality and consistency standards for which HP is known worldwide.

HP Delivers Consistently High Technology Quality

HP ProLiant servers are recognized quality leaders, manufactured to match the highest standards in the world. Other HP technology is also known to meet these standards, such as the

ROI Value Factoid:

Approximately 1,000 HP products have achieved the Energy Star® qualification from the US Environmental Protection Agency (EPA).**

**As reported by HP

BladeSystem components. High quality and consistency in systems manufacture saves rework, delay and breakdown when it comes to OEM manufacturing. It also raises the value of the solution to OEM end-user customers, with higher levels of reliability and lower support costs over time.

Addressing the Power and Cooling Challenge

Unique HP Thermal Logic technologies are built into HP BladeSystem, ProLiant and Integrity servers. Smart technology like thin provisioning, dynamic capacity management, and offline storage are all offered as part of the HP StorageWorks portfolio. HP's continued leadership and commitment to delivering energy efficient products and solutions is evidenced by the fact that over

1000 HP products have achieved Energy Star® qualification from the US Environmental Protection Agency (EPA).

Unmatched Breadth of Technology Options

Bell Micro offers OEM access to a full range of HP technologies and equipment, including ProLiant and Integrity server systems, StorageWorks devices, BladeSystem components, and ProCurve intelligent networking. KEHP Group analysts judge this to be the broadest portfolio of OEM-Ready technology available anywhere in the industry.

Global Availability of Support and Service

HP fields 65,000 consultants and technical support experts around the globe. Trained, certified and available 24x7 to support OEM business operations, global availability can lower costs by helping to resolve problems quickly. In the case of OEM businesses, the need for swift problem resolution can include the need to visit end-user customer sites, troubleshoot and diagnose problems in components that are integrated into a total solution offering, and replace faulty parts quickly. Through their Authorized Support Partner (ASP) program, HP offers OEM partners access to spare parts depots located across North America and worldwide. HP also offers OEM partners the option to resell Care Pack services to their end-user customers, as a means to raise

their perceived value, competitiveness and revenue. OEM partners can even be certified to deliver the services, further lowering costs and raising profits.

Bell Micro offers shipment of HP equipment worldwide, which speeds fulfillment to global OEM manufacturing locations. This strategy can also minimize tariffs.

Bell Micro Leads in Offering OEM-Ready Program Value for HP Technology

As discussed in the previous section, HP offers a broad range of OEM-Ready technologies with high proven quality, supported by global service teams. Bell Micro makes these even more attractive to OEM teams, by offering them with OEM-Ready programs designed to simplify and streamline OEM operations – and further reduce hidden OEM costs.

Bell Micro OEM-Ready programs simplify inventory management and related operational processes for OEM businesses of all sizes. Bell Micro and HP have worked together to remove the obstacles to gaining access to world-class HP systems technology, without the overhead and risk presented by unnecessary reporting and forecasted sales commitments.

Bell Micro and HP have worked together to offer OEM customers design and engineering assistance required to simplify the custom configuration process. Bell Micro and HP engineering teams work together with OEM teams, to understand requirements, specify the custom details, and test, test, test until the configuration details are worked out appropriately. Customers interviewed by KEHP Group as part of the fact-gathering process reported that Bell Micro teams did the leg work for them and removed, conservatively, around 10% of the cost overhead of custom builds from the manufacturing process.

Bell Micro works together with HP to provide OEM teams with advanced notification and access to product roadmaps, along with assisting in the parts replacement and redesign process.

In summary, Bell Micro has made ease of doing business a priority in structuring OEM-Ready programs for their OEM customer community.

Increasing OEM Opportunities with HP-Branded Equipment and Services

OEM organizations can differentiate their own products and services, by building on HP-branded equipment and services. HP component quality and technology innovation is recognized

Market Leadership Factoid:

Bell Micro is the leading supplier of HP equipment and services to OEM organizations.**

**As reported by Bell Micro

worldwide. Moreover, HP service and support Care Packs can be offered under the Authorized Support Partner program by OEM teams as a branded extension to OEM business. Bell Micro also offers easy re-branding of Care Pack marketing materials for immediate use with OEM prospects and customers.

An opportunity cost can be harder to evaluate than downside costs, because OEM teams may never realize the opportunities that they miss when they work with less well-branded equipment, without OEM-Ready service and support offerings.

OEM organizations with limited credentialing and brand awareness may benefit from building on HP branded equipment. Organizations selling into vertical industries with low tolerance for failures and outages, or who need help with improving problem resolution for their customers will also benefit from the competitive boost.

Conclusion: HP and Bell Micro Deliver More to Help You Build OEM Better™

An evaluation of the top 10 hidden costs to OEM businesses requires careful consideration of every step in the life of an OEM solution. The OEM solution lifecycle includes design and engineering, to manufacture, to promotion and acceptance, to adoption and deployment, and through to service, support and retirement. At every step, working with a technology supply team that understands the challenges and constraints of OEM business practices is critical to OEM competitive success.

HP provides unmatched technology innovation, recognized quality and market acceptance across the broadest range of interoperable systems components available in a single portfolio. Bell Micro adds OEM-Ready programs that provide critical flexibility and simplification of critical OEM business operations. Together, HP and Bell Micro offer unique and compelling advantages for building OEM better in ways which lower tangible costs, improve competitiveness and increase revenue opportunities for their OEM partners.