The Art of Smart Services™

VOLUME 1: Building the Business Case

MAY 2007 / WHITE PAPER

nPhase®
a QUALCOMM® business

Executive Summary

A "perfect economic storm" is occurring today in aftermarket product service, fueled on the demand side by asset owner/operators requiring unprecedented levels of asset uptime, reliability, availability, and output; and on the supply side by manufacturers facing increasing commoditization and competition on the product side of their businesses.

The result: best-in-class OEMs like ABB, John Deere, Gardner Denver, Siemens, and countless others are looking beyond product-based sales alone for differentiation, profit margin, and growth. To compete, leading product companies are developing new revenue streams derived from post-sales service offerings, and are strengthening their brand image based on customer service and satisfaction.

> *Any industrial manufacturer that has not awakened to the fact that it must become a* ***service business*** *is in serious peril today.*
>
> **— Harvard Business Review**

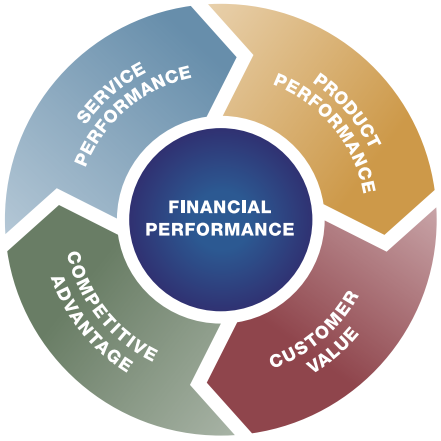
OEMs that manufacture everything from jet engines to photocopiers are thinking and acting more strategically about product quality and performance over the entire product lifecycle. Indeed, today's leading manufacturers derive more than 50% of their revenues and 60% of their margin contributions from services as opposed to product sales, according to the Harvard Business Review.

An OEM's capability to offer lifecycle service contracts, predictive and preemptive maintenance, and premium service levels can make the difference between a customer-for-life and a lost deal. In this competitive climate, "Smart Services" are uniquely poised to transform the product value chain just as monumentally and irrevocably as the Internet did to commerce.

Smart Services are differentiated post-sales product support capabilities, enabled by wirelessly capturing and analyzing real-time product performance information, and usually delivered by manufacturers or service providers to the owners/operators of the serviceable equipment or machinery. Original equipment manufacturers (OEMs) deploy these solutions enterprise-wide, so that service and support professionals can proactively manage and optimize entire installed bases of assets at multiple customer locations.

The true "art" of Smart Services resides in the development of a complete enterprise-wide solution that satisfies the business goals and requirements of the OEM, the service network, and the asset owner/ operator. The most successful Smart Services deployments are developed and delivered as consultative solutions, versus transactional products.

The OEM's Business Case for Deployment



The *Smart Services Value Blades*™

Ultimately, any justification for Smart Services must tie back to tangible bottom- and/or top-line results. OEMs that have adopted Smart Services typically report financial returns in five primary areas:

1. Service cost savings
2. Improved cash position
3. Service-native revenue growth
4. Service-driven product revenue growth
5. Overall profitability

The means for achieving these financial ends can be classified into four foundational areas of improvement— Service Performance, Product Performance, Customer Value, and Competitive Advantage—otherwise known as the *Smart Services Value Blades*™.

Each individual blade can drive financial performance on its own, but when manufacturers capitalize on the cumulative effect of excelling in all four areas, true business transformation can occur.

Getting Started

This paper provides a framework for creating a Smart Services business case that addresses the unique needs of your business. To learn how nPhase, a QUALCOMM business, might help you in building your business case, please contact us at smartservices@qualcomm.com.

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TABLE OF CONTENTS

FIGURES

TABLES

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The OEM's Business Case for Deployment

A "perfect economic storm" is occurring today in aftermarket product service, fueled on the demand side by asset owner/operators requiring unprecedented levels of asset uptime, reliability, availability, and output; and on the supply side by manufacturers facing increasing commoditization and competition on the product side of their businesses.

The result: best-in-class OEMs like ABB, John Deere, Gardner Denver, Siemens, and countless others are looking beyond product-based sales alone for differentiation, profit margin, and growth. To compete, leading product companies are developing new revenue streams derived from post-sales service offerings, and are strengthening their brand image based on customer service and satisfaction.

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A true solution is defined by and designed around a customer's need, not around an attempt to find a new use for a supplier's current products.

— McKinsey & Company

An OEM's capability to offer lifecycle service contracts, predictive and preemptive maintenance, and premium service levels can make the difference between a customer-for-life and a lost deal. In this competitive climate, "Smart Services" are uniquely poised to transform the product value chain just as monumentally and irrevocably as the Internet did to commerce.

Smart Services are differentiated post-sales product support capabilities, enabled by wirelessly capturing and analyzing real-time product performance information, and usually delivered by manufacturers or service providers to the owners/operators of the serviceable equipment or machinery. Leveraging on-board sensing and control devices and wireless Internet connectivity, Smart Services solutions allow manufacturers to remotely capture and analyze asset performance data, identify root causes of failure and trigger corrective workflows including repairs, upgrades, and technician and part dispatch. These solutions are deployed enterprise-wide, so that service and support professionals can proactively manage and optimize entire installed bases of assets at multiple customer locations.

Smart services have dramatic business implications for the manufacturer and for its customers. In order to justify an investment in a Smart Services solution, an OEM must understand the likely impact on its own operational and financial performance, as well as on those of its customers.

The Smart Services Value Blades™

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The *Smart Services Value Blades*™

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Value Blade™ 1: *Service Performance*

Blade 1: Service Performance

One of the most immediate bottom-line returns from Smart Services is a reduction in field service dispatches. In fact, best-in-class companies stated that remotely executed repairs resulted in 30% fewer technician dispatches, according to a recent Aberdeen study.

Aberdeen estimates the average cost of dispatching a service technician to be approximately $209 per dispatch, and the average number of daily service calls per technician to be three. Using this as a baseline, dispatch avoidance alone can amount to millions of dollars in annual savings (Table 1).

Table 1: *Dispatch Avoidance can save Millions*

—Source: AberdeenGroup

Number of Field Technicians	Average Service Calls per Day per Technician	Total Dispatches per Year	Average Cost per Dispatch	Potential Reduction in Dispatches	Annual Savings Opportunity
50	3	36,000	$209	30%	$2.3 M
100	3	72,000	$209	30%	$4.5 M
250	3	180,500	$209	30%	$11.3 M

Even in those instances where a field service dispatch cannot be avoided, detailed data on asset performance and maintenance history, problem diagnostics, and spare part requirements can be delivered to a technician prior to dispatch, thereby reducing the frequency of "broken calls" (i.e. multiple on-site visits for the same service order). In fact, OEMs with Smart Services solutions in place have reported a 27% improvement in first-call resolution rate (Figure 1).

Coupled with savings resulting from product recall reductions, SLA non-compliance penalty avoidance, and in-warranty repair cutbacks, savings from field service dispatch reduction can frequently make the case for an initial-phase deployment of Smart Services.

Cash Position

Smart Services solutions can dramatically compress service order-to-cash cycles and thereby improve a company's overall cash position. Here's how:

In a service environment where the OEM or its service network partner has a time-and-materials service agreement with the asset operator, days, weeks, and sometimes months can go by between when the service entity executes a work order and when it receives payment. This elongated order-to-cash cycle does not sit well with CFOs who are tracking and reporting a days sales outstanding (DSO) metric.

Since Smart Services solutions can be integrated with order management, invoicing, and CRM systems, service orders can be executed and transacted almost simultaneously.

Service Revenues

Based on the unprecedented service chain agility and responsiveness afforded by Smart Services, market-savvy OEMs can actually spawn new revenue streams based solely on new levels of service and support. In fact, a recent Aberdeen study showed that leading OEMs have seen a 20% increase in service-native revenues as a result of this approach (Figure 1).

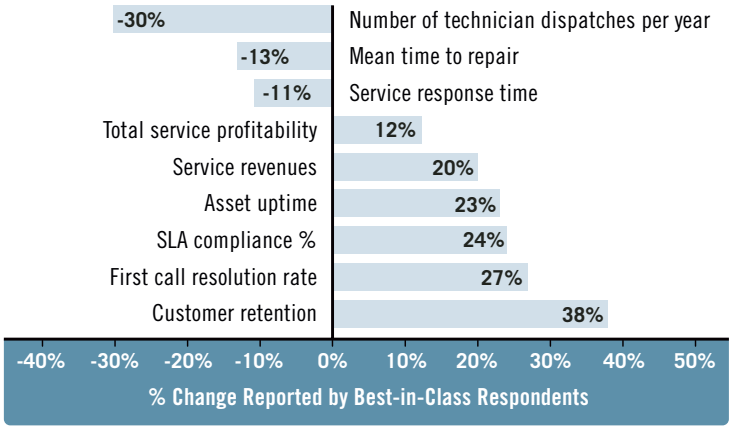


Figure 1: *Impact of Smart Services Solutions on Customers and Operations*

—Source: AberdeenGroup

Many of these OEMs will revamp their sales incentive structure to encourage their sales force and even their field service technicians to cross-sell and up-sell Smart Services offerings to existing customers. As such, these companies have managed to draw significant top-line contributions from their service operations, without having to increase head-count.

Overall Profitability

Profit margins on aftermarket service and parts range from 25% to 1000% higher than margins on products, and leading OEMs derive as much as 40% to 50% of their overall profitability from post-sale service and maintenance.

Against this backdrop, Smart Services can enable OEMs to beef up margins on both the bottom- and top-lines, by shaving down service costs and accelerating service and product revenues.

What's your own company's potential service performance upside? Contact us at smartservices@qualcomm.com to learn about our Blade 1 ROI Calculator.

Value Blade™ 2: *Product Performance*

Blade 2: Product Performance

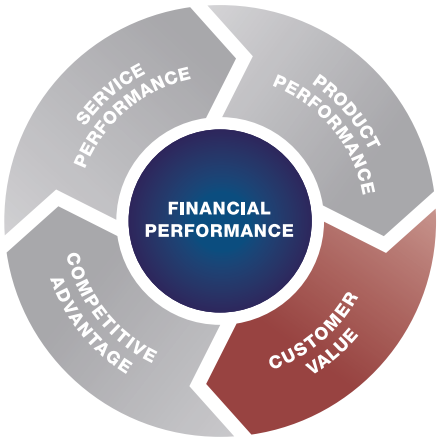
Deficiencies in product quality can manifest themselves in corporate financial statements in countless ways, including the following:

- In-warranty repair costs
- Overinvestment of "lazy capital" into warranty reserves
- Product recall expenses
- Customer churn

Smart Services solutions can unlock critical data about product design and performance that can equip engineering teams with the insights they need to improve subsequent versions of a product. With this kind of asset data accruing continuously over time, a manufacturer can dramatically reduce warranty costs and product recalls and ultimately retain a larger share of its customer base.

Blade 3: Customer Value

The absence of customer value would actually negate the viability of the other three blades of value. If the asset owner/operator does not see value in a Smart Services offering, the approach will not be sustainable.



Value Blade™ 3: *Customer Value*

But herein lies the opportunity for OEMs: since customers might not immediately perceive the value in Smart Services, it is the responsibility of the OEM to clearly articulate and demonstrate exactly how Smart Services can impact the customers' business performance.

Many OEMs aptly choose to absorb the initial deployment costs of a Smart Services solution—justifying the investment purely on internal cost savings and productivity improvements. But subsequently, there are ample opportunities to commercialize the offering.

Three places for an OEM to start in demonstrating the business impact of Smart Services on their customers are **Total Cost of Asset Ownership, Return on Assets (RoA), and Total Revenues.**

Total Cost of Asset Ownership

Over the lifecycle of a serviceable asset, Smart Services can impact total cost of ownership for the operator in three fundamental areas: 1) operating efficiency, 2) risk reduction, and 3) total usable life.

> *OEMs [using Smart Services] can take greater ownership of their customers by tailoring services to each customer, and no one can touch the customer profitably without going through [the OEM].*
>
> **— Harbor Research**

1. Operating Efficiency

High-use equipment that is operated improperly or used in the wrong application can result in unnecessarily high energy costs for the operator. For instance, service executives at **Gardner Denver**—the $1.7-billion industrial equipment manufacturer—estimate that over the 10-year life of a standard shop floor air compressor, electric costs can reach more than a $500,000 at five cents per kilowatt-hour, and over $1,000,000 at ten cents.

In the business of compressed air, also known as the fourth utility, inefficient asset operation is an endemic problem, so Gardner Denver took the initiative to deploy a Smart Services solution in an effort to make sure that their customers run their compressors properly (Figure 2). By monitoring the equipment in real-time, Gardner Denver can notify customers of impending issues that might cause unplanned downtime, or let them know their operating costs are escalating. This will pay off handsomely in the form of dramatic power cost savings for Gardner Denver's customers.

Figure 2: *Example End-to-End Smart Services Solution*

2. Risk Reduction

Asset operators are subject to countless operational and financial risks. First, numerous government agencies require compliance with a constantly changing group of financial, environmental, safety, and other regulations. Failure to comply with any one of them can result in significant monetary penalties and/or disciplinary action levied on the asset owner/operator.

Smart Services equip the OEM with the real-time asset visibility required to head-off imminent non-compliant situations before they occur. To socialize this concept with a customer, an OEM need only compare the annual cost of a Smart Services solution with the average annual regulatory non-compliance penalties the customer has incurred over the past three years.

For instance, in the food service equipment industry, the U.S. Food and Drug Administration (FDA) established a regulation called Hazard Analysis and Critical Control Point (HACCP), which, among other stipulations, mandates that preventive measures be in place to avoid food contamination at every critical point in the value chain. This might include setting the minimum cooking temperature and time required to ensure the elimination of harmful microbes, for instance. Smart Services can not only provide the ubiquitous asset connectivity required to monitor health and performance, but also can serve as the system of record when the time comes to demonstrate HACCP compliance to the FDA.

Other regulations that require asset operators to access and keep records of their assets' location and performance include Sarbanes-Oxley, the Health Insurance Portability and Accountability Act (HIPAA) (Medical equipment), and many other industry-specific policies.

In addition to ensuring higher rates of regulatory compliance, Smart Services can also dramatically reduce the asset owner/operator's liability exposure. For instance, insurance premiums on industrial and commercial equipment can shrink significantly if the operator can show to an agency a proactive health monitoring process that minimizes unplanned downtime and optimizes the asset's operating conditions.

3. Total Usable Life

Consider this: service organizations predominantly schedule preventative maintenance (PM) calls at regular intervals throughout a calendar year. This approach ignores the possibility of variance in asset utilization based on business conditions, company size and industry type. In other words, service organizations conduct preventative maintenance at predetermined times whether or not the asset needs servicing. This greatly reduces the serviceable life of an asset as wear and tear on machines is a function of usage, not time. Smart Services solutions can track asset usage and provide critical insight into exactly when assets will need servicing, thus extending their usable life or mean time between failure (MTBF).

Quantifying Asset Uptime in Return on Assets (RoA)

Those OEMs that have a Smart Services solution can, on average, support asset uptimes that are 12% higher than those companies that don't have Smart Services, according to a recent Aberdeen study (Table 2).

Table 2: *Smart Services Users Outpace Non-Users in Asset Uptime*

—Source: AberdeenGroup

	Asset Uptime	SLA Compliance %
WITH Smart Services	**96%**	**86%**
WITHOUT Smart Services	84%	75%

Using this as a baseline, an OEM can tie its ability to increase asset uptime directly to its customers' return on assets (ROA)—which is a measure of how well a company converts capital assets to revenue and profits. ROA is a key driver of a company's stock price and shareholder value.

Companies in capital-intensive industries will often compensate for unplanned downtime by building in excess capacity. So, it follows that more downtime often results directly in more capital investment, having a detrimental impact on ROA.

Here's a sample ROA-impact calculation, which adopts the assumption that the 12% difference referenced above represents unplanned downtime.:

Table 3: *Illustration of Smart Services Impact on Asset Owner's ROA*

Asset Owner / Operator Corporation	
Annual Net Income	**$50 million**
Total Asset Capacity (hrs/year)	**624**
Amount Invested in Core Production Assets	**$150 million**
Revenue Produced per Hour	**$400,000**

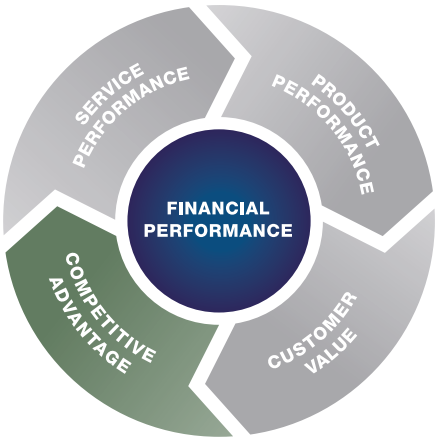
	WITH Smart Services	WITHOUT Smart Services
Asset Uptime	**96%**	**84%**
Unplanned Asset Downtime (hrs/year)	24.96	99.84
Amount Invested in Excess Capacity Assets	$9,984,000	$39,936,000
Return on Assets (ROA)	**31.3%**	**26.3%**

With these kinds of customer returns resulting from a 12% reduction in asset downtime, consider the impact **ABB Robotics** stands to make on its customers' performance, boasting a 70% reduction in asset downtime as a result of its Smart Services solution. The $1.3-billion operating unit of the industrial manufacturing giant has leveraged a Smart Services solution to roll out its ABB Remote Monitoring (ARM) service to its customers in automotive, general industry, and other markets. On the one hand, the company

saw an opportunity to dramatically reduce robot downtime and to provide service more cost-effectively, by eliminating on-site troubleshooting and coordinating spare part and field technician dispatch. But more importantly, these service delivery performance upticks have dramatically impacted ABB's customers' performance. One customer saved more than $100,000 in robot programming time and production throughput on a single robot outage, due to ABB's ability to respond.

Total Revenues

In the above example, the difference between 96% and 84% asset uptime equated to about $30 million in annual revenues for a $250-million company. Granted, this is a hypothetical situation, but this is the kind of discussion an OEM needs to initiate with customers that do not readily see the tangible impact that Smart Services can have on their own performance.



Value Blade™ 4: *Competitive Advantage*

Blade 4: Competitive Advantage

Industry studies have shown that OEMs with Smart Services offerings are four times as likely as those without to achieve asset uptimes of greater than 95% and three times as likely to achieve service contract compliance greater than 91%.

In markets where products are approaching commodity status, margins are slim, and competition is fierce, this kind of differentiated performance can provide an OEM the edge it needs to maintain or capture the lead in the market penetration of its products.

Therefore, in addition to service-native revenues, Smart Services can also drive product revenues and marketshare if they are positioned alongside product sales and marketing efforts. In fiercely fought turf-battles, a Smart Services offering can be a critical deciding factor for an end-user to choose one brand of equipment over another.

Increasingly, OEMs that have been product-centric for years are featuring product lifecycle services more prominently in advertisements and marketing collateral in an effort to differentiate themselves from competitors. Some of these companies have "productized" their Smart Services offering, branding it and co-mingling it with product branding and messaging. Indeed, manufacturers are competing with entirely new weapons (Figure 3).

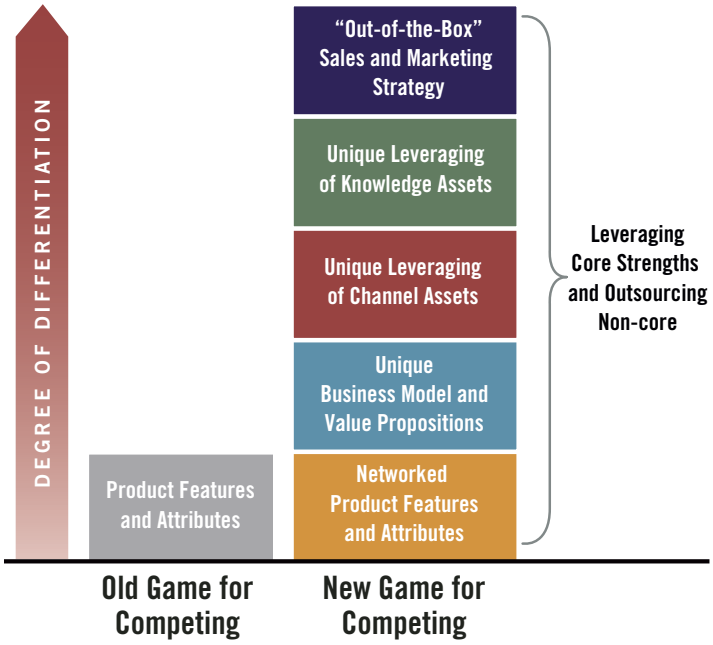


Figure 3: *New Game for Competing*

Further, once in place, Smart Services provide a much more defensible competitive posture than would a new product feature or capability. The reason: as opposed to being chronologically finite, smart services are serialized offerings delivered over the lifecycle of a product that cement a long-term relationship between a manufacturer and its customers. This makes it extremely difficult for new market entrants to unseat the incumbents.

Getting Started

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About the Author:

Mark Vigoroso

Mark Vigoroso has spent the past 12 years in the service and supply chain arenas. As Chief Services Strategist at nPhase ,a QUALCOMM business. Mr. Vigoroso works with industrial, commercial, and other OEMs and their service providers in developing and sustaining business cases for Smart Services solutions.

Prior to joining QUALCOMM, Mark spent five years at the Aberdeen Group, where he founded the market-leading Service Chain Management research practice and the Chief Service Officer's Summit Series, and he also served as Aberdeen's Chief Research Officer. During his tenure at Aberdeen, Mark researched, published, and consulted on technology and business best practices in field service optimization, service inventory management, remote product service, service contract management, and other service supply chain disciplines.

Mr. Vigoroso has also held senior product management, business development, and marketing roles at a number of procurement and supply chain technology providers. He is currently the Blogmaster of SmartServicesBlog.com and a member of Aberdeen's Research Advisory Board.

Mark's Contact Information:

Chief Services Strategist
nPhase, a QUALCOMM business
(312) 577-1615
vigoroso@qualcomm.com

About nPhase, a QUALCOMM business

Founded in 1990, and now part of QUALCOMM, nPhase delivers solutions that enable product manufacturers and their service network partners to deliver differentiated value after the initial product sale, throughout the entire product life cycle.

How? Our end-to-end solutions capture asset performance data in real-time over wireless networks. Service, engineering, marketing, and sales organizations can leverage this data to improve asset uptime, reduce unplanned service calls, bolster service revenues and profitability, improve product quality, and retain more customers.

Here's what defines nPhase:

1. **Customer-focused:** Whether your company requires managed network services or complete end-to-end Smart Services solutions, we develop, deliver and manage solutions that are tailored to your unique business and technology requirements.
2. **Comprehensive:** From the field devices necessary to interface with your product, to the wireless or wireline communications, IT infrastructure, software applications, and integration work that's required with your back-end systems, nPhase handles all of the technology side so you can stay focused on the core competencies of your business.
3. **Experienced:** Our team has been tackling and solving the toughest challenges in product-service business models for nearly two decades.
4. **Global:** QUALCOMM's world-class IT infrastructure provides 24/7 support throughout the world's major regions.
5. **Wireless:** Backed by QUALCOMM's legacy of technology leadership, we support ALL forms of wireless and wireline transport protocols.
6. **Future-proof:** Our solutions anticipate and incorporate new technologies while maintaining continuity with their legacy solutions, removing the risk associated with changes in technology.

For more information...

...about nPhase Smart Services solutions, visit www.nphase.com.

nPhase
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One North LaSalle Street
Suite 2850
Chicago, IL 60602

Phone: (312) 357-1650
Fax: (312) 357-1649

email: smartservices@qualcomm.com