



The Value of Aftermarket Service in a Changing Economy

Six Initiatives in Your Service Business to Generate Revenue & Profit

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Introduction

As we begin to emerge from a global recession, managers across a number of industries are faced with the daunting task of increasing revenue while reducing costs and conserving cash in an environment where product sales and prices remain highly variable. In the downturn many firms took drastic measures including workforce reductions, capacity cut-backs and divestiture of under-performing businesses. Some are facing the real prospect of bankruptcy and liquidation. But this singular focus on cost cutting results in missed top line opportunities; in these dynamic times aftermarket service has become a cornerstone of a successful business strategy.

Historically, the sale of aftermarket support has provided as much as 50% of a company's revenue and a disproportionately high contribution to profit. In many industries service contracts, spare parts and maintenance labor have some of the highest profit margins in the product portfolio. Today, however, many customers are tightly controlling their budgets for new product and services acquisition, and are looking for a rapid financial payback on any new expenditure. Aftermarket service presents some unique opportunities that make it a prime candidate for delivering value in both growing and receding economies. By increasing their market share of aftermarket parts and services, companies will be able to generate a more predictable, high margin revenue stream that will also increase customer satisfaction and retention.

Leading global enterprises such as Cisco Systems, KLA-Tencor, Boeing and Tellabs have proactively undertaken strategic service management initiatives and have seen ROI in as little as two months with benefits that include:

- **Cash flow improvements of 10%**
- **Inventory reductions of 15% to 50%**
- **Service level improvements of 5% to 20%**
- **Customer retention through new and differentiated service offerings**
- **Dramatically increased service revenues**
- **Higher levels of global coordination**

This white paper is written for executives in industries that manufacture, sell and support mission-critical products that are vital for customer value generation. This includes aerospace & defense, high technology and telecommunications, industrial and medical devices. The white paper will explain why the aftermarket is a prime area for delivering results in a changing economy, and includes a list of six strategic initiatives to consider that will help generate a positive ROI. It concludes with an approach for driving rapid change within your organization.

Why is Aftermarket Support an Area of Opportunity?

To understand the potential in the aftermarket business, it's helpful to first consider some characteristics of the aftermarket that create unique business opportunities:

- **Customer Relationships:** A company's set of existing customers is one of its most important assets. In the aftermarket arena a company has direct daily interaction with its customers and that experience directly influences their perception of the value of its products and services. The most effective response to today's challenges must recognize and build on existing relationships to help customers generate more value from the use of their products.
- **High Resource Investment:** As company executives are aware, resources invested in after sales product support exhibit some of the worst financial performance of any asset on a company's balance sheet. Spare parts inventory turnover, for example, is often an order of magnitude lower than the turnover for finished goods. It is natural, therefore, to look to these assets as a source of cash and investment reduction. There are valid reasons, however, for the low utilization of these resources. Service assets serve, much like an insurance policy, to protect against the risks of disruption caused by product failures. The aftermarket supply chain is vastly different from the finished goods supply chain, and includes extended global service supply networks with reverse logistics flows which add complexity and cost. Inventory must be pre-positioned to satisfy customer requirements. Demand is intermittent and difficult to forecast. While ripe with potential for improvement, any resource investment reduction must be carefully executed in a manner which recognizes these characteristics and their impact on customer satisfaction.
- **Aftermarket Profitability and Predictable Revenue:** The sale of parts and services to provide aftermarket support represents a significant portion of a firm's business (25% to 50% in most industries). Typically, these sales have some of the highest margins, providing, on average, 45% of profit. At the same time, the market share of the lucrative aftermarket business is low for many companies. A Deloitte benchmarking survey² found an average 40% share for services and a 70% share for parts sales. Capturing service revenue is important as it generates a recurring revenue stream, which is much more predictable than the uncertain revenue from new product sales. The design and delivery of new "service support products" represents an opportunity to increase both revenue and profit on a consistent basis.

- **Segmented Customer Requirements:** The market for service support is highly segmented and one size definitely does not fit all. As a result, there is great variation in what customers will pay for support that they require, (e.g. response time, part availability, repair turnaround time, etc.). These diverse requirements provide opportunities for differential pricing of service offerings and enhanced revenue generation.
- **The Competitive Advantage of Exceptional Service Delivery:** As previously mentioned, the management of service processes and resources is complex. There is a great disparity in aftermarket performance in most industries. The gap between leaders and average companies in metrics such as customer response time, inventory fill rate and product availability can be huge. For example, in a recent survey, on-time delivery rates in the auto industry were as high as 80% for the industry leader with a median value of 60%³. Firms that solve this problem correctly and offer exceptional service to their customers will have a definite competitive advantage.

How can these attributes of a firm's aftermarket business lead to effective ways for coping with the downturn? What are the opportunities that can be defined by a customer's reaction to current economic conditions? The following section highlights opportunities that will deliver strategic advantage and a significant short-term ROI in response to today's challenging environment.

What are the areas of opportunity?

The following are six high priority initiatives that can help your business generate increased service revenue, make improvements in market share, focus on customer retention, and see reduced support costs in the aftermarket business:

1. Reconfigure Your Service Supply Chain to Respond to Changing Costs and Customer Requirements
2. Reduce Overhead and Increase Time-to-Value Through Outsourcing and SaaS
3. Reduce Cost Through Optimization of Service Value Chain Resources
4. Increase Revenue Generation with Customer-Focused Service Offerings
5. Leverage Your ERP Investment Through Intelligent Decision Support
6. Proactively Manage Product Lifecycles to Respond to Changing Buying Patterns

Each of these opportunities is described in more detail below, with information on how MCA Solutions can help generate value, as well as real-world examples from customers in a number of industries.

1. Reconfigure Your Service Supply Chain to Respond to Changing Costs and Customer

Requirements: Best-in-class companies view inventory as a competitive weapon and typically employ multi-echelon inventory optimization and other resource deployment strategies to achieve superior product and service availability. But with increasing complexity driven by globalization of the service supply chain and the need to deliver differentiated service levels across diverse customer segments, service providers must also look to optimize the design and configuration of their service support network (locations, repair capacities, customer assignments, etc.) as a key strategy for achieving the lowest total cost and maximized customer service solution. Ideally, network optimization and inventory optimization must go hand-in-hand in an iterative design of the service network.

How MCA Can Help: MCA Network Design leveraged by MCA's Strategic Consulting resources can help companies determine the optimal supply chain configuration to respond to changes in customer contracts, transportation costs and service level offerings. By understanding the cost, inventory and service impact of various future business scenarios, supply chain and logistics managers can make data-driven decisions about the appropriate direction for dealing with the consequences of market and supply fluctuations. Network Design is typically used in response to network expansion, but it's equally important during a downturn. When falling business levels make it necessary to contract the service network, Network Design can be used to identify the optimal candidates for closure and model the impact on network inventory and transportation costs.

Case in Point: When a large networking technology provider bought their largest competitor, MCA Network Design was used to analyze the newly combined service supply chain and identified significant redundancies in warehousing and a large cost savings opportunity. Historically, network expansion was driven by new customer acquisition or response time commitments. But with Network Design, the entire network could be re-optimized with the addition of each new location allowing, in some cases, the closure of adjacent locations to account for the increased density.

This diagram illustrates some outputs of a typical re-design project.

The diagram below illustrates some outputs of a typical re-design project.



In a related analysis, MCA Network Design was used to evaluate the introduction of a two-hour service offering in competitive markets where four-hour service offerings were the standard. The analysis identified specific geographic areas where installed-base density and logistics capability would allow for reduced response time with minimal impact on overall costs and resource requirements. In other areas, the higher service level was cost prohibitive and was not justified by customers' willingness to pay.

2. Reduce Overhead and Increase Time-to-Value Through Outsourcing and SaaS:

Service providers can expand their capability with a lower cost structure by outsourcing non-core capabilities to their suppliers. Logistics and warehousing is a typical area that is outsourced to 3PL Providers who can leverage their infrastructure to provide these services more efficiently. Another area of outsourcing opportunity is IT resources. The implementation of new IT systems to provide the capabilities described in this paper can be delivered in a hosted or Software as a Service (SaaS) model, which is rapidly becoming the approach of choice. An implementation of SaaS decision support for service systems allows companies to support service objectives with rapid implementation of advanced capabilities without draining constrained IT resources.

How MCA Can Help: MCA customers have leveraged MCA OnDemand, the company's

SaaS model, to rapidly implement full planning capability with minimal impact on IT resources and a rapid return on investment.

Case in Point: Tellabs, a leading provider of next-generation networking equipment to telecom companies, reduced inventory levels by over 50% after a two-month SaaS implementation as described in this case study:

<http://www.mcasolutions.com/case/TellabsCaseStudy.pdf>. By hosting the software in a secure, high-availability data center, the solution can be deployed leveraging a shared IT infrastructure with minimal customer resource.

The diagram below summarizes the capability and benefits of MCA OnDemand.

This diagram summarizes the capability and benefits of MCA OnDemand™.

MCA OnDemand™ Capabilities			
Software Usage and End-User Support		Maintenance and Upgrades	
Hosting	Training	Set-Up and Configuration	
Integration		Optional Consulting	
Benefits of MCA OnDemand™ <ul style="list-style-type: none"> • Lower infrastructure costs & complexity • Reduced implementation risk • Removal of on-premise implementation pressure • Increased license flexibility • Decreased ramp-up times • Fast deployment • Automatic updates • Consistent ROI 			

3. Reduce Cost Through Optimization of Service Value Chain Resources:

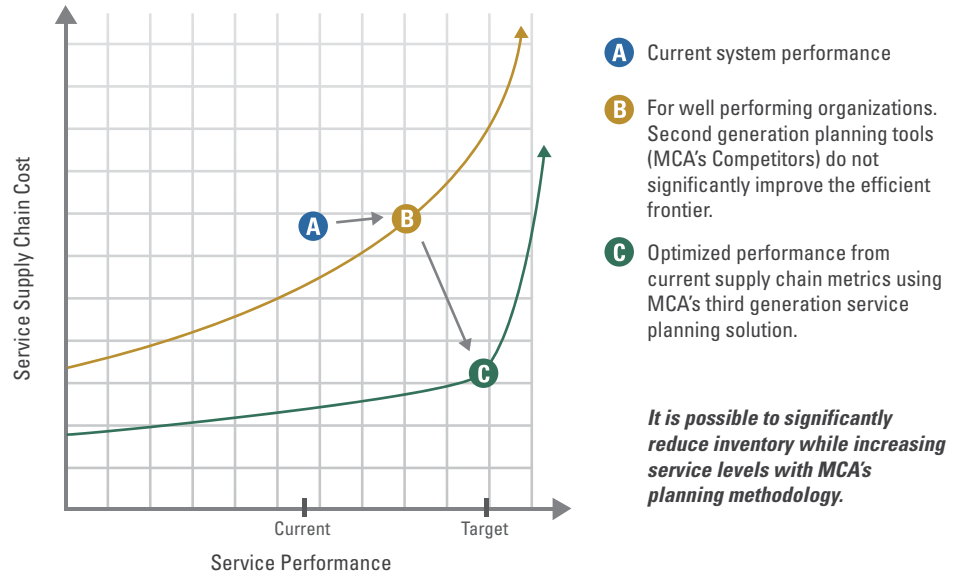
The management of the processes and resources required to provide customer support can be a complex task which requires careful evaluation of the tradeoffs between cost and service. In an environment of reduced customer demand and tighter resource constraints, this becomes even more difficult. In planning the service supply chain, determining the appropriate levels of inventory to purchase and repair and where to position it across an extended global supply chain is a critical decision that drives resource investment and the ability to meet customer service levels. Companies who use traditional planning tools developed for finished goods supply chains hold far too much inventory with the wrong mix of parts and are not able to meet their service level objectives.

How MCA Can Help: MCA's suite of products was developed to manage the requirements of a complex service environment and meet service objectives with the lowest possible inventory in an automated system that requires minimal manual intervention. MCA customers include organizations like the U.S. Navy, which manages billions of dollars of spare parts as well as smaller organizations with a few million dollars of spare parts spread across a much smaller network. These customers have used MCA's software to drive inventory reductions of 5% to 50% while increasing customer service levels. In a downturn, inventory optimization and rapid response to changing business conditions are critical. MCA customers have used the advanced causal forecasting and multi-period modeling capability in the solution to strategically manage inventory and pipeline levels while maintaining committed service levels in the face of rapidly falling demand.

Case in Point: After a four-month implementation, KLA-Tencor reduced overall supply chain costs by 4% while increasing local service levels by 19% as described in this case study: <http://www.mcasolutions.com/pdf/KLACaseStudy.pdf>

The diagram on the next page illustrates the service inventory tradeoff and illustrates how planning tools which leverage advanced optimization capabilities can shift the efficient frontier and determine the optimal stocking levels for the desired level of service. But many companies have traditionally relied on segmentation (ABC) and business rules to manage their inventory levels and are not comfortable with a pure optimization solution. MCA's advanced segmentation and business rule manager combines the rule-based approach with optimization providing users with the best of both worlds.

This diagram illustrates the service inventory tradeoff and how planning tools leveraging an optimization approach can shift the efficient frontier and determine the optimal stocking levels for the desired level of service.



4. Increase Revenue Generation with Customer-Focused Service Offerings:

During a downturn, customers will look to increase the value they can generate from using the products they own, and may have highly varied needs for the level of after sales service support. This will lead them to demand higher levels of performance (product up-time and availability) from the aftermarket service support process.

The design and delivery of "new service products" that meet specific customer objectives can generate increased revenue for the service provider.

When developing new service offerings, two important factors need to be considered:

- **Differentiated Service:** There is a broad disparity in service requirements and customers' willingness to pay. Offering differentiated services that meet individual needs, such as response time, part availability and repair turnaround time, creates a range of opportunities for the service provider to enhance revenue generation.

- **Pay for Performance:** Along with the escalating demands for service quality, customers now desire to move away from paying for support on the basis of the resources consumed when a product fails, i.e. “pay me when it is broken,” to one where they only pay for the value generated when the product is functioning, i.e. “pay me when it works.” This fundamental shift constitutes a realignment of customer and supplier incentives and relationships. In industries such as aerospace and defense, Performance-Based Logistics (PBL) has become the de facto standard. The research of MCA’s chair, at Wharton, suggests that PBL contracts can provide a true win-win opportunity for suppliers and customers alike⁴, not only in the defense world, but in commercial service environments as well. With offerings like PBL, the customer pays a premium for outsourced support because of the shift of additional risk and responsibility to their suppliers, while lowering overall support costs.

How MCA Can Help: The success of a new service offering is dependent on the availability of critical resources to ensure that customer requirements and expectations can be met. MCA Business Design capability allows customers to analyze specific support scenarios to determine the resource requirements and cost structure necessary to support a new service offering. Ultimately, this allows the service provider to understand the profitability impact of a new service offering and determine mutually acceptable contract terms and prices.

Case in Point: A leading supplier of semiconductor manufacturing equipment used MCA Business Design capability to design service products geared toward meeting customer needs in a downturn. Using Business Design to analyze the cost impact of various supply chain configuration and support scenarios, they generated a range of service offerings to meet differing customer needs. These offerings ranged from low cost “flex contracts” with flexible delivery terms for labor and parts, to performance-based contracts based on equipment uptime. In each case, it resulted in alignment of customer and supplier incentives and a continuation of a steady services revenue stream which became a higher percentage of total revenue as new product revenue declined. With higher overall market share, this company is well-positioned for rapid growth in service revenue when business levels increase.

5. Leverage Your ERP Investment Through Intelligent Decision Support: Over the past decades, manufacturers have made a tremendous investment in ERP systems to manage the transactional data in their businesses. In some companies, there is an integrated ERP system across the entire enterprise. More likely, particularly in the service business, there are multiple systems across different lines of business and for different applications. A decision support system developed for the service environment can link to multiple transaction systems, in order to leverage the transactional data available to make faster, more accurate decisions and bridge the gap between planning and execution.

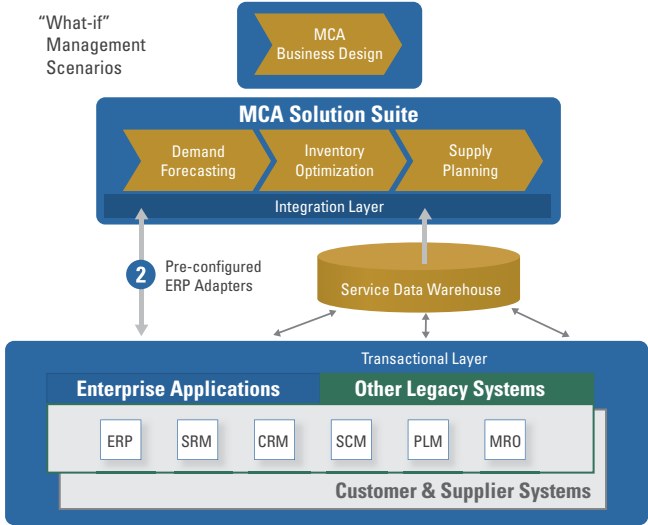
The leading ERP companies have expanded their capabilities, become more open and have enabled integration with best-of-breed vendors such as MCA Solutions to provide specific functionality leveraging the innovation and flexibility that comes from smaller companies. Leveraging service-oriented architectures allows component-based solutions to be plugged into the ERP backbone to meet specific service requirements.

How MCA Can Help: MCA customers have implemented MCA's solution in a wide variety of ERP environments with an ROI typically in less than a year, much faster than the standard ERP implementation time. MCA's solution was selected by SAP as their Endorsed Business Solution to complement and extend their service parts planning solution, and has been implemented across a broad range of industries in SAP, Oracle and other ERP environments.

This diagram demonstrates how MCA's Solution Suite integrates with transactional systems to generate critical planning decisions.

The diagram below demonstrates how MCA's SPO integrates with transactional systems to generate critical planning decisions.

Planning / Decisions Support & Fit with Transaction Systems



- Management Performance Predictions:**
- Analysis and comparison of service scenarios
 - Contract support cost
 - Changes to supply chain data
 - Lifecycle cost of ownership
- Planning Outputs:**
- Forecasts
 - Stocking levels
 - Part deployment decisions
 - Repairs, purchases, allocations

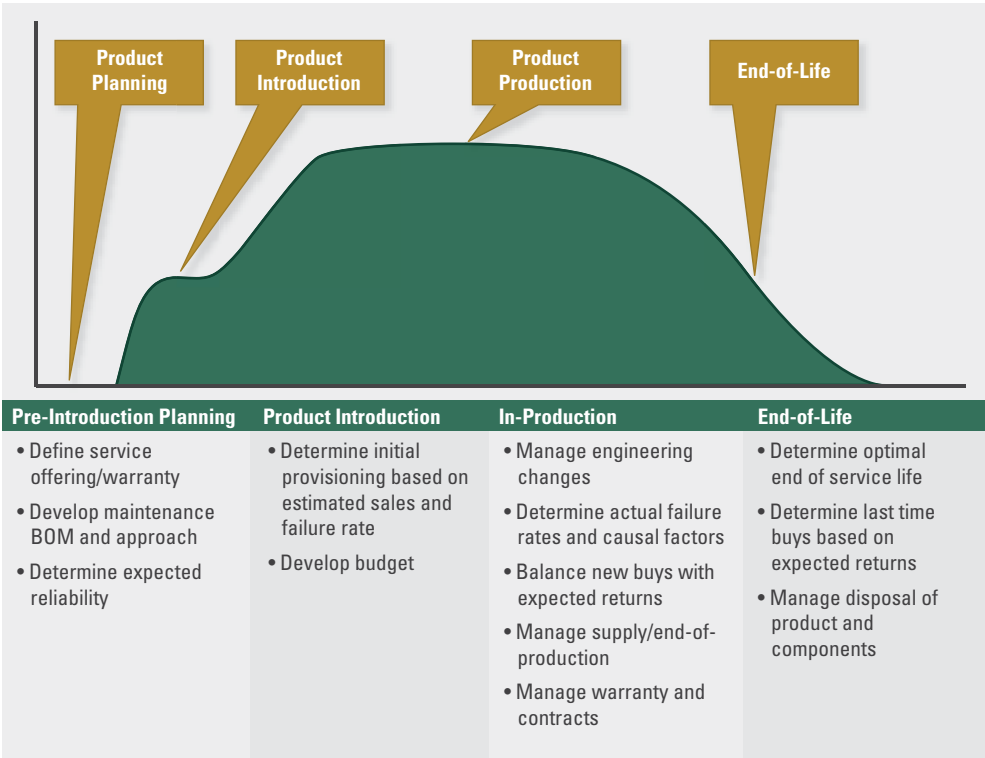
6. Proactively Manage Product Lifecycles to Respond to Changing Buying Patterns:

Many product users will become more interested in holding on to existing products for a longer period of time in order to reduce the investment required for the acquisition of new capacity. Existing customers represent a captive market for aftermarket revenue generation. Product suppliers can increase the cash flow from this source by increasing the time between new product introductions. Product manufacturers therefore have an opportunity to cut back the rate of new product introduction and the level of product variety. This suggests that current customers can provide an increasingly stable, long-term, high-margin source of revenue growth by properly managing the service lifecycle of their products.

How MCA Can Help: MCA's solution offering allows decision support for lifecycle planning to manage the entire product lifecycle from new product introduction through end-of-life planning. As product lifecycles are extended, this has implications for product sourcing, stocking and end-of-life buys, which, if done without the appropriate analysis, will result in either an inability to meet service commitments or in obsolete inventory. Managing lifecycles effectively will optimize customer service and contract revenue while minimizing cost-to-serve.

This diagram illustrates decisions that must be made through the product lifecycle that can be supported with sophisticated decision support tools.

The diagram below illustrates decisions that must be made through the product lifecycle that can be supported with sophisticated decision support tools.



Implementation of the initiatives we have discussed here can be challenging. It will be necessary to prioritize both short-term initiatives and longer-term strategies to achieve the greatest contribution to current needs. These initiatives will also contribute to meeting service goals and corporate objectives that will persist even after the current economic crisis subsides. A structured approach to prioritizing initiatives and getting management buy-in is critical for driving change.

Delivering Results

In spite of traditional impediments to change and the complexity of service support management, it is possible to succeed in the adoption of the initiatives we have discussed if the following conditions are met:

- 1. Identify specific change opportunities** in the aftermarket business that can be implemented quickly.
- 2. Perform the appropriate analysis to determine the ROI for the initiatives** and make an internal management business case for deployment.
- 3. Drive change from the top.** This is a given in today's environment if senior management is serious about looking to customer service support for answers to the questions they have posed.
- 4. Expect to re-design fundamental business processes** and be prepared to re-structure and incentivize your organization to do so.
- 5. Be prepared to make an investment in the decision support systems** that will be needed to enable implementation of the changes that you have adopted. **Utilization of SaaS models** will enable these systems to be implemented rapidly and with reduced resources.

The aftermarket business has unique attributes that make it a prime candidate to be a source of relief to the challenges posed by the current economic downturn. Strategies for achieving this relief must recognize specific customer and supplier responses that affect the tradeoff between cost and service. Aftermarket investments, service levels and operating costs can all be affected, ultimately shifting the efficient frontier between cost and service. This shift can provide an opportunity for companies to leverage their aftermarket business to provide answers to the tough questions outlined above.

About MCA

Dr. Morris A. Cohen is the Panasonic Professor of Manufacturing and Logistics at The Wharton School, University of Pennsylvania. The preeminent authority on service value chain optimization and strategy founded MCA Solutions to bring the intellectual capital of strategic service management from the classroom into the technology marketplace.

MCA Solutions' award-winning service parts planning and optimization software helps aerospace and defense, high-tech and capital equipment companies of all sizes transform their service supply chains into bottom-line business drivers, by reducing inventory, lowering support costs and improving service levels to maximize customer satisfaction. MCA is an SAP-Endorsed Business Solution and complements and extends SAP's service parts planning solution.

MCA Solutions is a privately held company headquartered in Philadelphia. To learn more, visit www.mcasolutions.com or contact Carolyn Gross at carolyn.gross@mcasolutions.com or 970.669.1017.

APPENDIX: MCA Solution Suite Overview

MCA's Solution Suite was developed based on years of experience to result in the industry's leading solution for service parts planning. It includes the following modules:

MCA Business Design provides what-if simulation using standard or user-defined planning templates to compare cost and budget impact of longer term business scenarios, including:

- Changes to physical supply chain configuration
- Design and pricing of service product
- Warranty and contract service-level offerings
- Assignment and realignment of customers to service contracts
- Lead time and cost trade-offs for new buy or repair
- Budget analysis of bid and proposal scenarios
- Product introduction and end-of-life

The result is increased control for decision makers trying to develop a more profitable service offering at the highest possible levels of service for the customer.

MCA Demand Planning & Inventory Optimization forecasts parts demand and determines optimal stocking lists and stocking levels to achieve maximum levels of service at the lowest possible cost. This component provides the following capabilities:

- Best forecasting technique selection to manage all demand types – intermittent, faster-moving, seasonal
- Composite forecasting which blends historical demand, installed-base and service entitlements, and causal data based on data availability and product lifecycle stage
- Multi-echelon, multi-indenture optimization to determine what to stock, at what location and at what level of the service BOM
- Optimal stocking levels across the extended network including customer, dealer, repair and supplier locations
- Advanced network analysis and design
- Pooling and rationing of service inventory
- Contract coverage analysis

- Fill rate or availability-driven service levels with budget constraints
- Generation of actual field failure rates to provide feedback to product design
- Collaboration with customers to share information critical to managing the extended supply chain

MCA Supply Planning takes the time-phased demand plan, service targets and optimal inventory positioning from MCA Inventory Optimization and generates optimal new buy, repair, transshipment and allocation orders to meet service level objectives at the lowest possible order cost. MCA Supply Planning provides the following capabilities:

- Customizable views by planner to manage daily work
- Full lifecycle management from initial provisioning to end-of-life buys
- Rebalancing of inventory from excess to shortage locations at minimal cost, respecting tariff and geographic constraints
- Chaining and supersession logic incorporated in all order recommendations
- Automated or user-defined approval workflow across planning theaters within the organization and to external trading partners
- Prioritizes all orders and expedites using a risk-based approach that optimizes tradeoff of stockout risk and logistics cost
- Sourcing decision support to determine best source of supply
- Incorporate demand for scheduled maintenance events as well as unplanned failures
- Collaboration and approval across internal organizations and outside the enterprise with secure access customizable by user

MCA Network Design is designed specifically for aftermarket service supply chains and allows users to design a network of service locations that meets customer support requirements at each echelon in the network while simultaneously evaluating the impact on total inventory. Different network design scenarios can be viewed and evaluated using the integrated Google Maps capability and the Scenario Manager. MCA continues to work closely with customers and leading 3PL providers to further refine the capability.

While traditional tools focus on the assignment of customers to stocking locations using shortest distance calculations and other business rules in a static network configuration, MCA Network Design functionality uses advanced optimization techniques to iteratively address 3 critical problems:

1. Determining the minimum number of stocking locations to open in order to cover all customer locations at contractual support levels.
2. Assigning customers and contracts to open stocking locations to minimize total transportation cost.
3. Evaluating the impact of changes to the service network on total inventory requirements

Working with a number of clients in strategic consulting engagements, MCA has applied its network design functionality to a diverse set of problems including 3PL outsourcing, greenfield network design, contract pricing and other redesign initiatives.

Notes:

¹ M. Cohen, N. Agrawal and V. Agrawal, "Winning in the Aftermarket", Harvard Business Review, May, 2006, pp. 129-138.

² Deloitte Consulting Benchmark Study, 2008

³ Deloitte Consulting Benchmark Study, 2008

⁴ S. Kim, M. A. Cohen and S. Netessine, "Performance Contracting in After-Sales Service Supply Chains", *Management Science*, Vol 53, No. 12, December 2007, pp. 1,843-1,858, S. Kim, M. A. Cohen and S. Netessine, "Reliability or Inventory? Contracting Strategies for After-Sales Product Support", Working Paper, OPIM Department, The Wharton School, 2007 and S. Kim, M. A. Cohen, S. Netessine and S. Veeraraghavan, "The Curse of Reliability: Outsourcing Restoration Services for Infrequent, High-Impact Equipment Failures", Working Paper, OPIM Department, The Wharton School, 2008.