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The Forgotten Supply Chain:

How Original Equipment Manufacturers Can Create Value by Optimizing the Aftermarket Business

By R. Douglas Derrick and Robert Jacoby

In this issue:

Despite a challenging business environment, original equipment manufacturers are uniquely positioned to improve their performance by optimizing the aftermarket business—a historically neglected supply chain area.

The authors identify two approaches—dealer channel collaboration and scientific service-parts management—to demonstrate how these companies can identify and capture value.

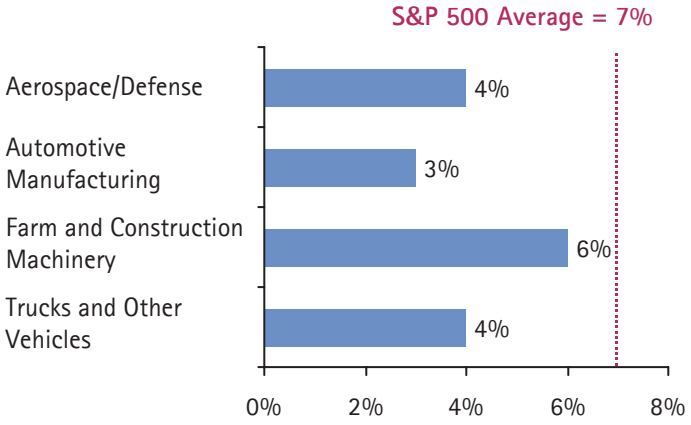
Over the past 20 years, heavy equipment, automotive and industrial-product original equipment manufacturers (OEMs) have invested significantly in new capabilities to help them reduce costs, grow revenue and better utilize capital. The primary goal has been to convince Wall Street of their ability to create shareholder value and, as a result, improve their share price.

Despite these efforts, these manufacturers now find themselves in a classic "value squeeze," as margins continue to shrink, return-on-asset measures lag other sectors and the value from lean manufacturing dries up. Additionally, global and domestic competition has increased, thus magnifying the pressure to perform. As a result, many OEMs—especially those in the "big iron" industries—have failed to increase profits and, in turn, have delivered below-average returns to shareholders during the decadelong bull market of the 1990s (Figure 1).

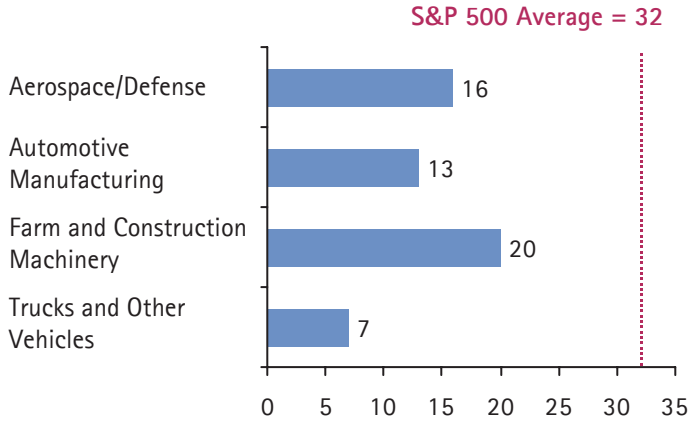
Historical Attempts and New Industry Dynamics

Big iron OEMs have pursued numerous cost-cutting and growth initiatives to improve economic profit, which have been met with varying degrees of success. For example, the manufacturing and quality revolutions of the 1980s were critical to saving American heavy industry from Japanese competition. Additionally, the enterprise resource planning (ERP) wave of the 1990s delivered data and process integration across sprawling, multinational companies at a level once thought unattainable. More recently, investments in customer relationship management and supply chain management have given new selling and operating capabilities to OEMs.

Automotive and Industrial Equipment Companies' Net Profit Margins (Five-Year Average)



Automotive and Industrial Equipment Companies' Price/Earnings (P/E) Ratios



Source: Media General Financial Services. P/E ratios calculated in January 2000.

Figure 1: "Big iron" OEMs have historically faced below-average annual revenue growth and lower levels of net profitability, which has been reflected in their diminished price/earnings (P/E) ratios.

Other corporate-level strategies for value creation have been pursued, also with mixed results. For example, automotive joint ventures and foreign investments have given OEMs such as General Motors a form of virtual, global expansion. Commercial aircraft OEMs have engaged in product innovation by proposing next-generation avionics, advanced material airframes and super jumbo jets to their customers. Companies such as General Electric are currently moving away from diversification strategies that were previously explored, as they shed noncore businesses to refocus on financing, selling and servicing equipment. Additionally, the heavy equipment, trucking, automotive and industrial product industries also have experimented with mergers and acquisitions throughout the past decade.

To further complicate the issue, emerging industry dynamics seem to be working against OEMs' quest to improve sales and profitability. Although OEMs anticipate that customer expectations will to continue to evolve, other fundamental changes also are occurring. Following are notable examples:

- Driven by customer demand, OEMs are offering complex customer-support agreements that contain significant penalties for failure.
- Customers are less interested in buying original equipment, and are more interested in shifting their operating risk to manufacturers and negotiating a guaranteed operating cost.
- Time-specific and reliable service-order promising—once considered a competitive advantage—is now a routine expectation.
- To remain lean and responsive, dealers are demanding more frequent and smaller stock replenishment orders, without assuming the premium fulfillment costs.

The combination of financial pressures and industry dynamics will force OEMs to search for value in the after-market business—a historically neglected area identified as "the forgotten supply chain."

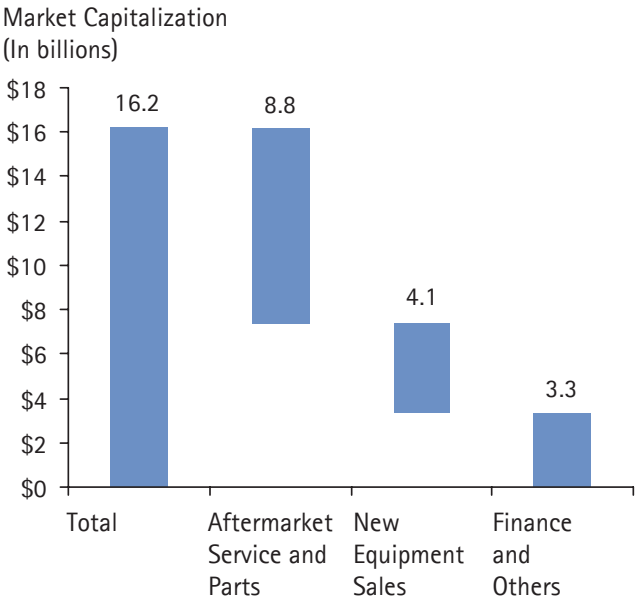
- OEMs are introducing more complex products on a more frequent basis to stave off the product commoditization that some industries are facing.

The combination of financial pressures and industry dynamics will force OEMs to search for value in the aftermarket business—a historically neglected area identified as "the forgotten supply chain." This area of business activity is often referred to as "post-sales service and support" and "service management."

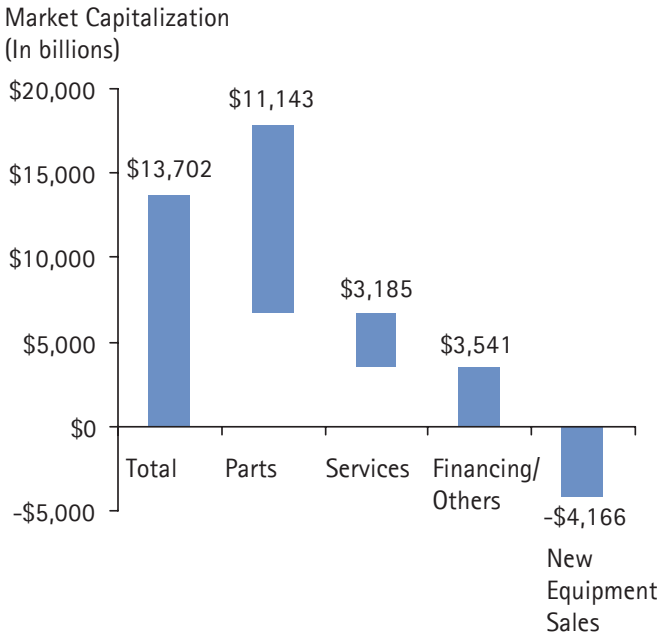
Why Service Management?

The most compelling reason for OEMs to focus on the service business is simple: It's where the revenue opportunities are. The financial value proposition of the service business is typically much more attractive than the "whole goods" (equipment) side of the business. Specifically, the service business's combination of higher net margins and decreased capital requirements (less factories and manufacturing assets to finance) leads to greater shareholder value creation.

Market Capitalization Decomposition for a Global Heavy Equipment OEM



Market Capitalization Decomposition for a North American Aerospace OEM



Source: Accenture analysis, publicly available financial data. Market data collected in March 2002.

Methodology: Economic profit calculation by line of business is used to create an economic profit/market capitalization ratio, which is applied to overall market capitalization for decomposition.

Figure 2: Financial modeling demonstrates how new equipment sales often contribute little to, or even depress, the overall market capitalization of an OEM.

OEMs are uniquely positioned to tap into the aftermarket business through the installed base of equipment they have sold. After all, who is better positioned than the original equipment seller to insert itself into the life cycle revenue stream that a customer generates when owning and operating the asset?

Decomposing the market capitalization of several OEMs demonstrates how different lines of business contribute to—or take away from—enterprise value. The analysis shows that selling equipment oftentimes has little effect on market capitalization, and occasionally is even detrimental (Figure 2). The relatively higher value that Wall Street places on the service and financing lines of business for these manufacturers is clear.

Wall Street also believes in the "higher quality" of service management revenue compared to original equipment revenue. Sales from parts and service generally are less cyclical than equipment sales, which are subject to industry-specific seasonality, such as the harvesting season, the approval of capital budgets, the emergence of recreation-friendly weather and new model years.

Conversely, an installed base of equipment can guarantee an annuity-like (and stable) revenue stream to the parts and service business. Also, switching costs are higher for proprietary parts and services than for simple equipment replacement, thus giving service revenues greater longevity once a customer is landed.

Another obvious, but critical, fact is that OEMs are uniquely positioned to tap into the aftermarket business through the installed base of equipment they have sold. After all, who is better positioned than the original equipment seller to insert itself into the life cycle revenue stream that a customer generates when owning and operating the asset?

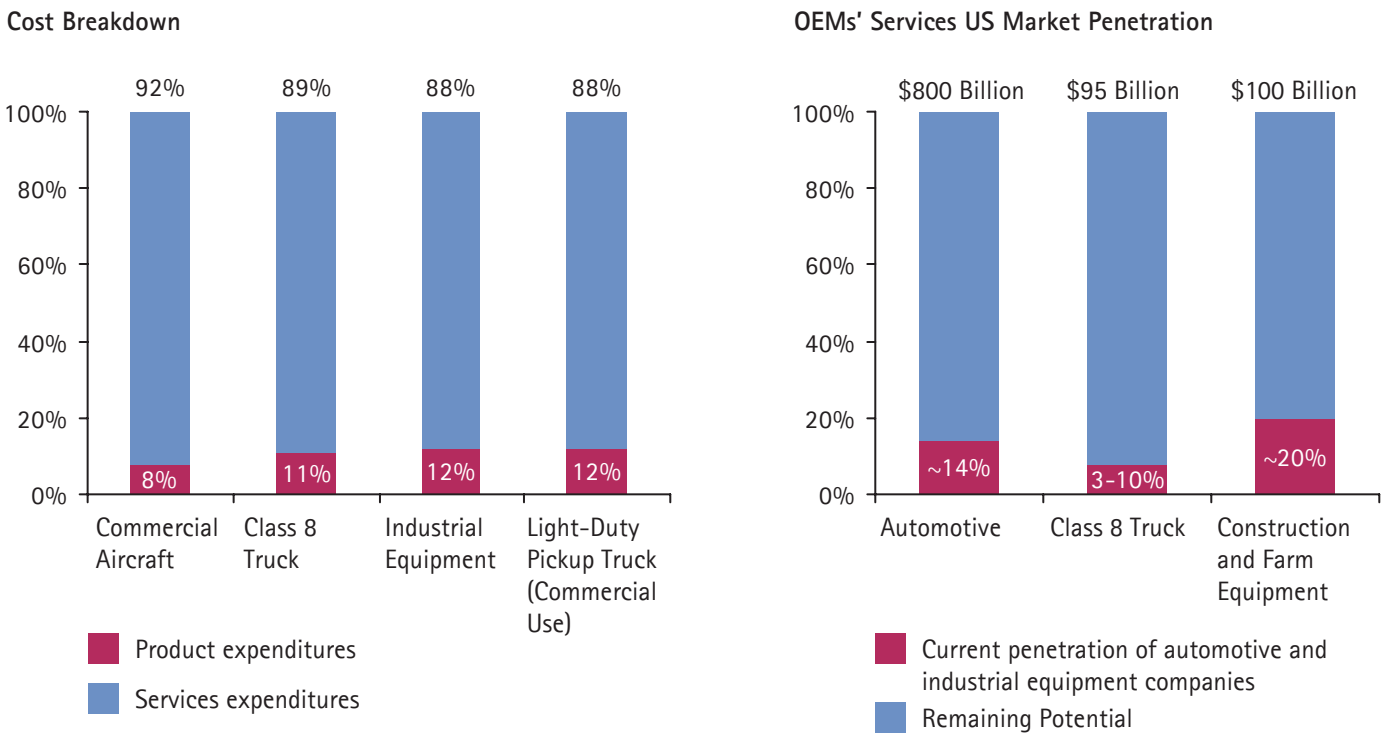


Figure 3: The original equipment purchase is typically only a fraction of the life cycle costs that a customer faces. Unfortunately, many OEMs have been unsuccessful in capturing these life cycle costs as post-sales service revenue. Services include fuel, parts, maintenance, tires, insurance, financing and driver compensation.

Few OEMs have successfully implemented collaborative processes with their dealer network. However, those that have been successful at collaboration have enjoyed numerous benefits.

Research demonstrates that this can be a double-edged sword for OEMs. The left half of Figure 3, originally published in *Harvard Business Review*, demonstrates the relatively small revenue contribution that the original equipment sale made to life cycle revenues. The right section then demonstrates that it is not uncommon to find low levels of service market penetration by OEMs among their installed base. This suggests that a significant opportunity may exist.

A final compelling rationale for OEMs to consider service management for value creation is the proven relationship between service excellence and customer loyalty. Delivering world-class post-sales service and support has a direct and positive connection to repeat purchases and reduced selling costs. An automotive industry analysis by J.D. Power and Associates (a market research firm focused on customer satisfaction tracking) reveals a tight correlation between customer satisfaction with post-sales service and customer intent to repurchase the same brand.

Proven Approaches

Clearly, OEMs need to find new sources of value creation, and service management is a source that has yet to be fully tapped. Although many OEMs have enjoyed the higher margins that a service business typically delivers, few have used pioneering approaches to identify and capture the significant service management value that can drive competitive advantage and influence financial health. Two approaches for capturing this value are:

1. Dealer Channel Collaboration: Implement collaborative programs and technologies to strengthen integration between the dealer channel and the OEM.
2. Scientific Service-Parts Management: Apply scientific principles to optimize the planning of service-parts inventories, and thus drive cost and service performance to new levels.

1. Dealer Channel Collaboration

Although collaboration among OEMs and their independent dealer network is valued conceptually, its definition still remains unclear. Furthermore, few OEMs have successfully implemented collaborative processes with their dealer network. However, those that have been successful at collaboration have enjoyed numerous benefits. For example, a North American recreational vehicle OEM, together with its dealer network and Accenture, launched a Collaborative Inventory Management (CIM) program in January 2000 that has increased sales, improved wholesale and retail inventory productivity, and provided visibility into point-of-sale demand for the OEM.

The need for the program was driven by several factors:

- Proliferation in the number of retail SKUs that an OEM dealer can offer
- Lack of visibility into retail demand by the recreational vehicle OEM
- Capital scarcity at smaller dealers, which typically results in excess inventory
- Lack of inventory management skills at dealerships

The project began with an analysis: The CIM team gathered each dealer's unique product, customer and market strategies to customize the CIM program to each of their requirements. Recommendations regarding inventory planning were developed based on dealer input, store sales, dealer demographics, new vehicle deliveries and wholesale sales forecasts. Dealers then worked with the CIM team to review and modify the recommendations. In the spirit of collaboration, dealers made the final decisions regarding all inventory planning parameters.

The launch strategy for the CIM program was to start small; make a limited investment; and prove the concepts, processes and benefits of collaborative inventory planning before investing in technology. Following this path, the first step was to pilot CIM with a limited number of SKUs to understand the dynamics of OEM/dealer collaboration and identify constraints and benefits. SKUs for the pilot represented an assortment of fast and slow movers in the parts, accessories and general merchandise categories.

Once the pilot SKUs were selected, the CIM team developed and tested the deployment and replenishment algorithms. While the program's basic processes were being developed, the team selected three pilot dealers based on their participation in previous programs offered by the OEM and their willingness to assist in the development of the CIM program. To minimize the risk to pilot dealers, the recreational vehicle OEM funded the pilot and agreed to subsidize any expenses the dealers incurred from their participation. The results of this "low-tech" pilot were successful for all parties: Retail product availability increased for each pilot dealer, which resulted in quantifiable improvements in retail revenues for pilot dealers and wholesale revenues for the OEM.

Collaborative Inventory Management Replenishment Process

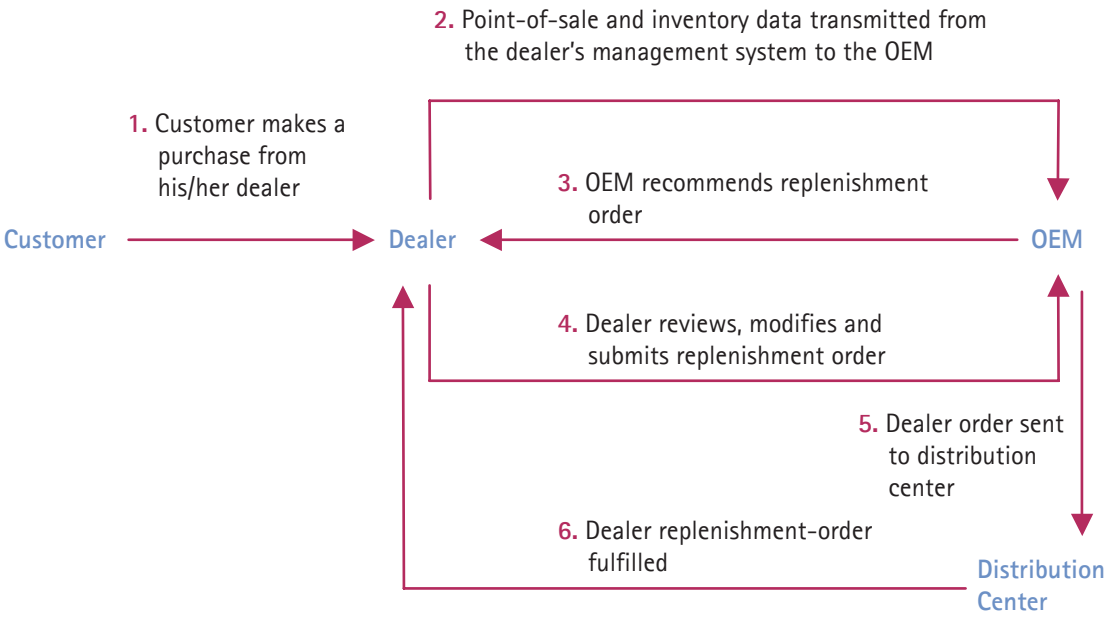


Figure 4: CIM replenishment not only enables two-way replenishment collaboration in the dealer channel, but also provides retail point-of-sale data back to the OEM.

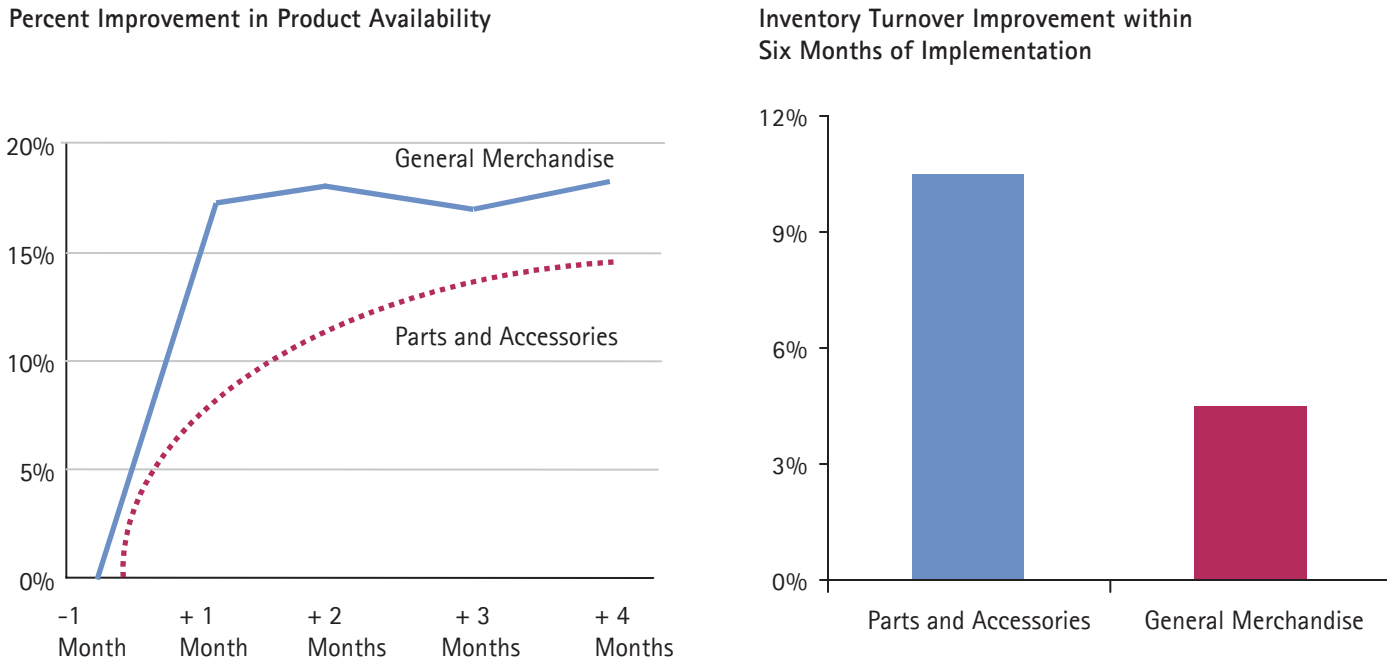


Figure 5: Retail product availability steadily improved, as the CIM processes and algorithms progressed over time. Inventory turns also showed significant improvement, as the faster and more collaborative CIM program accelerated material movement in the replenishment pipeline (North American recreational vehicle OEM).

Dealers that adopted the solution have been able to stock a larger selection of products, while improving over-the-counter availability of parts and accessories by 14 percent and general merchandise by 19 percent.

Following the pilot, the team developed the technology blueprint needed to automate and scale-up the CIM processes. The technology solution—an off-the-shelf, advanced planning system (APS)—was chosen based on its scalability to the dealer network and its ability to integrate with OEM and dealer legacy systems. The resulting industrial-strength system consists of the OEM's proprietary dealer management system (DMS) integrated with the APS.

As shown in Figure 4, the overall replenishment process allows seamless collaboration between the OEM and its dealers. Each party makes updates to the inventory planning parameters, both collaboratively and on a scheduled basis. The planning parameters also are updated based on changes in demand, the introduction of new products and dealers' seasonal inventory needs.

Change management issues invariably arise with programs that alter the way people work; the CIM program was no exception. One issue experienced by the recreational vehicle OEM involved dealer incentives: The smaller, more frequent stock replenishment that CIM recommended conflicted with existing incentive programs that encouraged one or two monthly replenishment orders. Another issue was the need to clearly define the roles of the new CIM positions, given that the sales organization traditionally owned the dealer relationship. Lastly, dealer understanding, trust and buy-in had to be established in the channel to generate demand for the solution. CIM stakeholders currently are working to resolve these and all remaining issues. The OEM has developed and launched training and communications programs with dealer groups, and has enlisted the help of dealer advisory boards to facilitate the CIM concept.

The benefits generated by the CIM program have been real and impressive. As shown in Figure 5, dealers that adopted the solution have been able to stock a larger selection of products, while improving over-the-counter availability of parts and accessories by 14 percent and general merchandise by 19 percent. Dealers also were able to improve inventory turns within the first six months of implementation by 11 percent in parts and accessories and 4 percent in general merchandise.

Like any successful dealer-excellence program, CIM has delivered benefits to the OEM in the form of incremental, wholesale revenue growth. The incremental sales are generated from three sources: 1) the initial stocking orders created when dealers enter the program, 2) the replenishment of products that were previously not stocked by the dealers, and 3)a reduction in lost retail and wholesale sales. The parts and accessories wholesale sales growth for CIM dealers is 6.4 percent greater than for non-CIM dealers. In general merchandise, wholesale sales growth for CIM dealers is 15 percent greater.

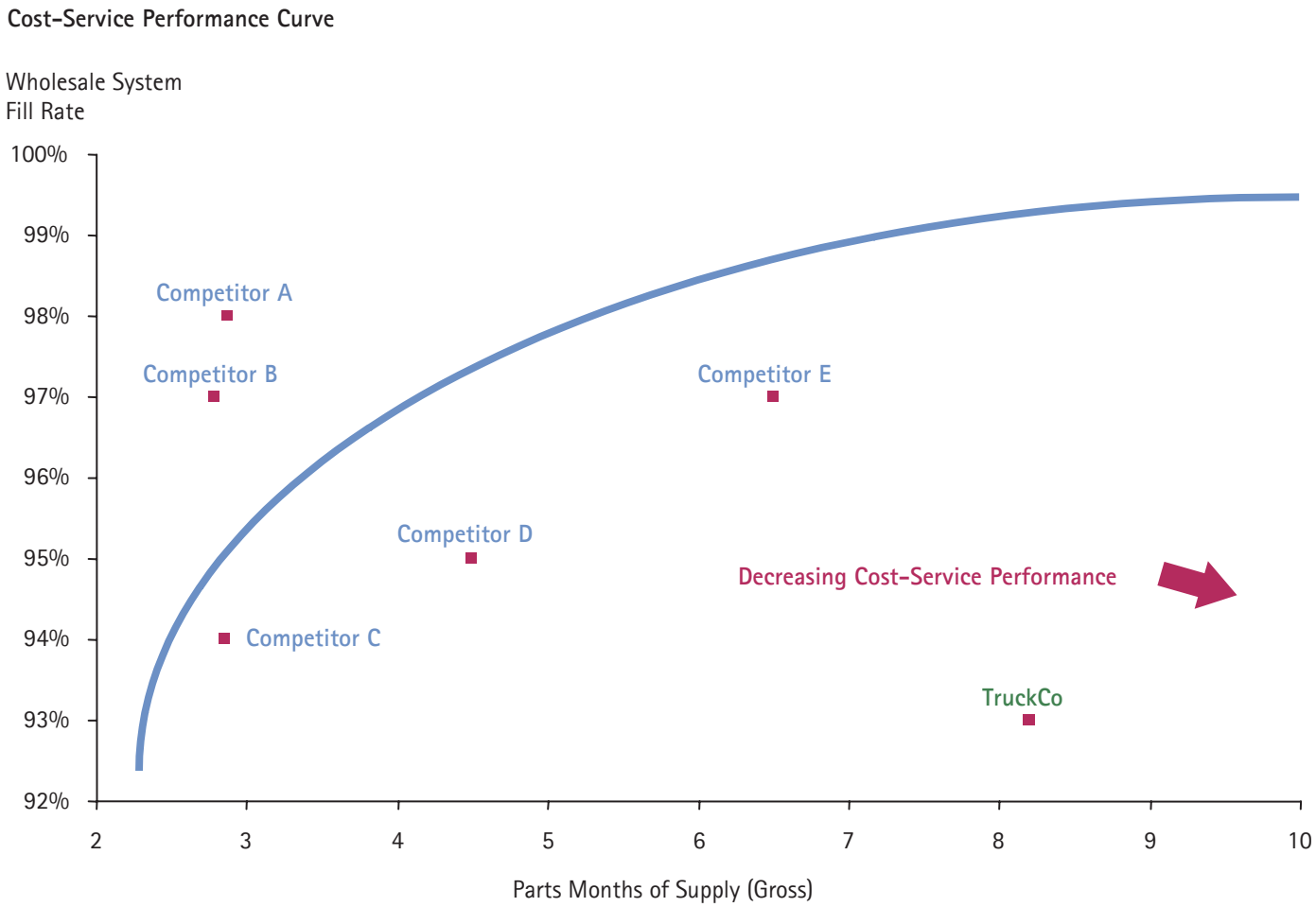


Figure 6: TruckCo's own benchmarking identified gaps in its cost-service performance compared to direct competitors.

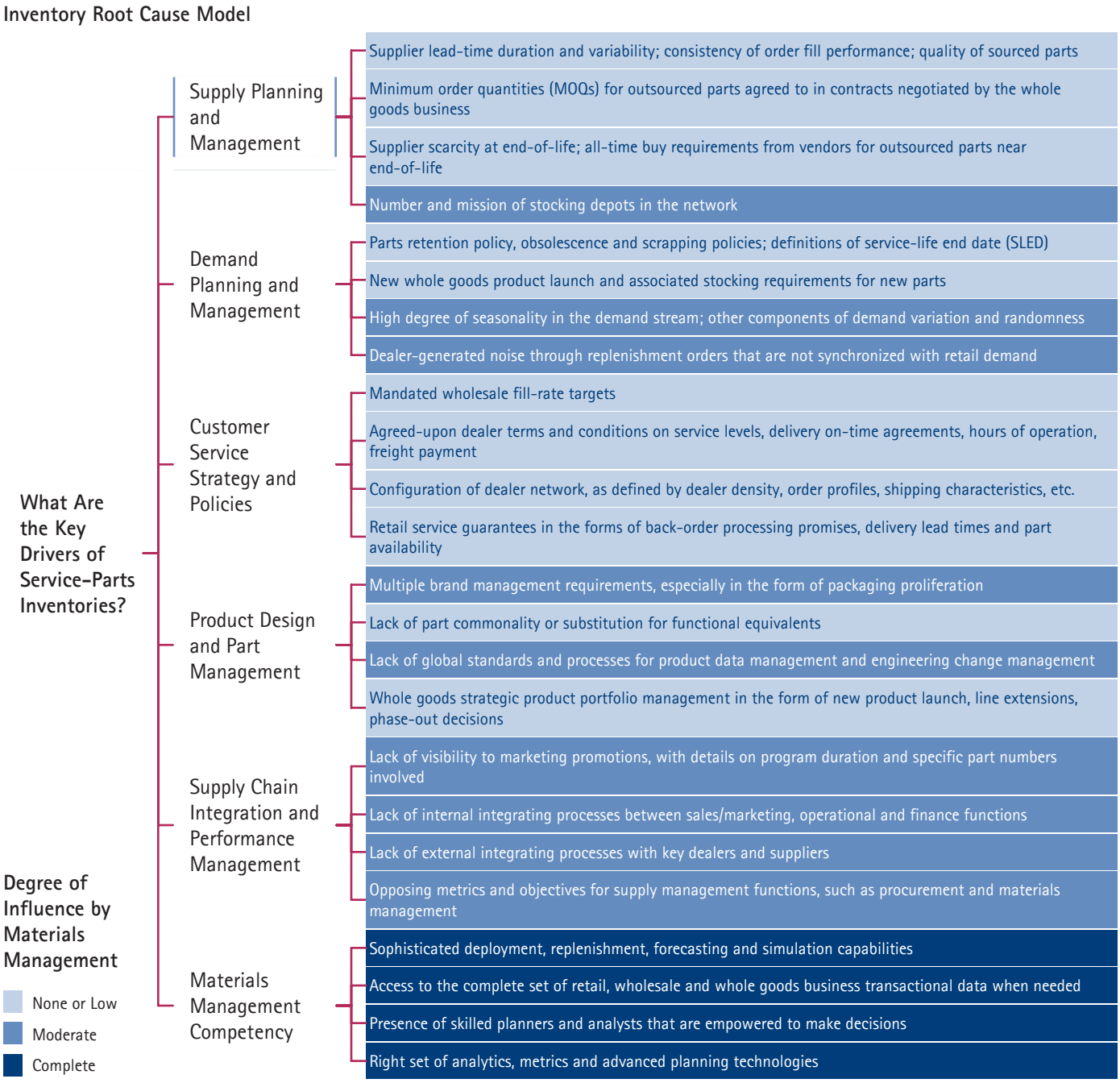


Figure 7: Many cross-functional factors drive inventory performance for spare parts.

This discovery is not uncommon in the service-parts supply chain: Inventory managers are routinely (and often solely) held accountable for inventory performance, while the actions of other departments are the true causes of turnover, obsolescence and availability.

The future looks bright for the CIM program. The team has begun a full-scale rollout of CIM to the dealer network, with the goal of reaching more than 50 percent of the OEM's 650-plus dealers in the next few years.

2. Scientific Service-Parts Management

In addition to dealer channel collaboration, scientific service-parts management can help OEMs capture value by determining the root cause of poor inventory performance and developing solutions to improve performance. For example, a North American OEM of big-rig trucks for commercial and industrial use—which we will refer to as TruckCo—knew that its service-parts performance significantly lagged industry competitors. Among other concerns, a self-conducted analysis revealed issues with cost-service performance, annual obsolescence costs, the number of wholesale orders split across multiple depots, and monthly forecasting accuracy (Figure 6).

To help address these issues, TruckCo's executive team selected Accenture as its consulting partner. Accenture's first meeting was with the director of materials management for global service-parts operations (GSPO), an executive who had received the brunt of criticism for GSPO's poor performance. The executive welcomed the project as an opportunity to convince senior management of the need for better functional integration, capability investments and technology upgrades.

After conducting a detailed diagnostic of improvement opportunities, Accenture concluded that materials management actually had limited control over the root causes that drive inventory performance—which substantiated the director's point of view. Accenture then developed an inventory root cause model to demonstrate the business issue to the directors of engineering, sales, product line management and procurement (Figure 7).

This discovery is not uncommon in the service-parts supply chain: Inventory managers are routinely (and often solely) held accountable for inventory performance, while the actions of other departments are the true causes of turnover, obsolescence and availability. There are numerous examples:

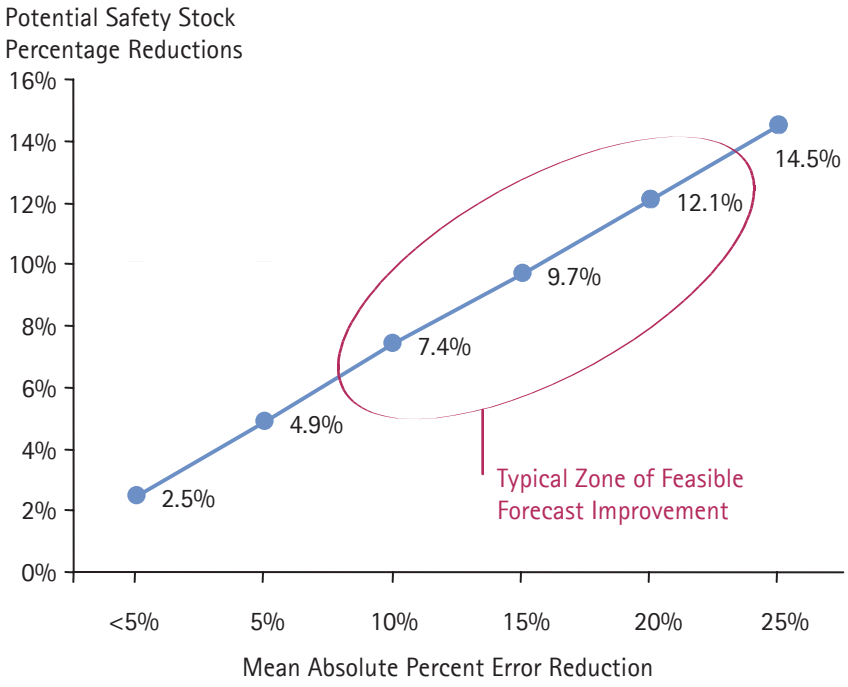
- Working with third-party OEMs, procurement negotiates contracts that specify minimum order quantities (MOQs) on replenishment orders of nonproduction parts. These contracts often far exceed basic time supply requirements.
- Engineering mandates 100 percent parts availability on day one of a new product launch, regardless of the failure rates and historical demand of like parts.
- Product line management launches pricing and promotional campaigns that drive unexpected demand, while providing limited cross-department communication on the type and duration of the campaigns.

With GSPO involvement, Accenture zeroed in on the main drivers of poor inventory performance for TruckCo:

- **Supplier lead time:** The variation and length of supplier replenishment lead times were inflating safety stocks at depots.
- **Supplier minimum order quantities (MOQs):** MOQs agreed upon by procurement and external OEMs were inflating on-hand quantities of slow-moving parts.
- **Parts deployment and replenishment:** The business had not spent time optimizing the planning tools and parameters for individual parts, causing supply and demand imbalances across depots.
- **Demand forecasting accuracy and bias:** Lack of a rigorous, data-driven and consensus demand-planning process was causing supply and demand imbalances across depots (Figure 8).

Forecast/Safety Stock Improvement Analysis

Forecasting/Safety Stock Trade-off for Typical Depot



Assumptions

"As is" safety stock calculated according to the following parameters:

- Lead times taken from data request
- Forecast interval of 4 weeks used
- Mean absolute deviation (MAD) of depot-level forecast was used in safety stock calculations as proxy for demand variability
- Mean absolute percent error (MAPE) improvement based on traditional formula: ABS[D-F]/D
- Current depot-level MAPE calculated
- Service level for "A" items was 98% (K factor)
- Service level for "B" items was 98% (K factor)
- Service level for "C" items was 95% (K factor)
- Service level for "D" items was 90% (K factor)

Figure 8: Feasible improvements in forecasting showed the potential for double-digit inventory reductions at depots.

The modeling completed by the team also identified significant cost– and service-improvement opportunities and appropriate solutions, which won the approval of the executive steering committee. Accenture's improvement strategy rested on two distinct programs for GSPO:

- Supplier Relationship Management (SRM) for Parts
- Parts Forecasting, Deployment and Replenishment Optimization

Supplier Relationship Management (SRM) for Parts

SRM for Parts modified TruckCo's strategic sourcing process, which was executed by OEM procurement personnel. Historically, GSPO had been only a recipient of the sourcing process, with little influence or input. This is not uncommon with OEM aftermarket businesses, given that most of the buying power is driven by OEM direct materials purchasing, while service-parts purchases may constitute only a fraction of that spend.

The diagnostic revealed that several Tier One parts suppliers were selling basically the same parts to both the commercial and industrial truck divisions, but were providing different delivery lead times and MOQs to each division.

Simply normalizing both of these parameters to the best common service across both divisions would result in significant inventory reductions.

The SRM program was designed to minimize—and, where possible, eliminate—unhealthy MOQs and to compress and stabilize supplier lead times. The diagnostic revealed that several Tier One parts suppliers were selling basically the same parts to both the commercial and industrial truck divisions, but were providing different delivery lead times and MOQs to each division. Simply normalizing both of these parameters to the best common service across both divisions would result in significant inventory reductions.

The first step in the SRM program was to form a team consisting of representatives from corporate procurement, finance, and GSPO procurement and logistics. The next step was an SKU-level analysis that identified the most misaligned minimum order quantities and the worst lead-time performers (by delivery date adherence variation and by length of lead time). For this analysis, the 80/20 rule was used: Identify the 20 percent of the system elements that drive 80 percent of the problems, and go after those first.

Third, the joint team mapped the SKUs back to originating suppliers and, using current contract and sourcing data, formulated a corrective action strategy for each supplier. Criteria used to determine influence over individual suppliers included their current contract status and performance level, renewal probability, annual dollar spend, and demonstrated ease of partnering. The finance and corporate procurement departments played balancing roles to ensure that no strategic sourcing agreements or relationships were compromised.

After the analysis, the more challenging work began: Account managers and executives at the targeted suppliers were contacted and informed of the SRM program and its intent. Face-to-face meetings with TruckCo's SRM team and the supplier team were supported by Accenture's analysis. To make the negotiations as painless as possible, a menu of ready-made solutions was presented to each supplier. For example, for suppliers that were within 24 months of renegotiation and had a high likelihood of renewal, a phased MOQ-reduction schedule was presented for their review, with the understanding that this would be a new condition of service in their upcoming contract. For other suppliers locked into long-term contracts, the SRM team offered a number of collaborative solutions to help drive down and stabilize replenishment times. These included forecast data sharing, extensions of sales and operations planning (S&OP) meetings via conference calls, and supplier involvement in new product planning.

The project team experienced remarkable success with the SRM program. The success rate among the targeted Tier One suppliers was greater than 60 percent, with success defined as the supplier agreeing to adopt a majority of the improvement recommendations made by the SRM team. The program is being rolled out to the few remaining Tier One suppliers not yet covered, and a negotiation schedule has been drawn up for Tier Two suppliers.

Parts Forecasting, Deployment and Replenishment Optimization

The Parts Forecasting, Deployment and Replenishment Optimization initiative was designed to address the fundamental processes and parameters affecting the planning and supplying of parts to depots and customers. GSPO's main problem was that it applied the same forecasting, stocking, lot sizing and review policies across all parts—regardless of the demand, supply and profit characteristics of the individual parts. For example, planners made no distinction between a stainless-steel fitting for an oil filter exhibiting high-volume demand, stable order patterns and quick replenishment lead times, and a specialized engine mount that rarely fails in the field, is sourced from one supplier and (due to machining requirements) has a six-month lead time. This lack of distinction clearly was a primary driver of the high split-shipment rate: Deployment and replenishment had not been optimized across the network,

causing lower availability for many parts and numerous referrals to noncustomer-facing depots (e.g., split shipments). TruckCo therefore could not recover the fulfillment costs (freight charges and depot labor) from its dealers for the referral lines in the split orders.

Typically, this problem is easier to identify than resolve. The sheer magnitude of the 250,000+ SKUs that GSPO was managing every day had simply precluded them from customizing deployment and lot-sizing algorithms for each one. The Parts Forecasting, Deployment and Replenishment Optimization project would give them the tools to accomplish this task.

The first step involved segmenting the parts into meaningful classes through a rigorous exercise. Numerous potential segmentation criteria were identified (Figure 9), and three rules were used to select the final criteria for creating the classes:

1. Each criterion, even if it was qualitative, must lend itself to quantitative modeling.
2. The project team must be in unanimous agreement about the scale and description of the criterion. For example, everyone had to accept a standard definition of "low, medium and high customer criticality" for a particular part.

Supply Characteristics Criteria		Demand Characteristics Criteria	
Supplier Lead-Time Variation and Duration	Total replenishment cycle time and variation, from order placement to receipt and confirmation.	Criticality of Customer Demand	High, medium or low, depending upon the application of the end user.
Supplier Delivery Performance	Complete order fill rate (COFR), so that all units, lines and orders are delivered on promised date.	Degree of Demand Perishability	To what degree will future sales be lost if the order is not filled.
Contribution Margin or Standard Cost of Part	Profitability or standard acquisition cost of part to TruckCo's global service-parts operations.	Degree of Customer Involvement	How is the customer involved in field service and repair.
Replenishment Frequency	Average number of replenishment orders made per year for the parts.	Economic Importance of Customer	Annual sales and profit contribution of the customer, with estimates of future contributions.
Economic Lot Size	The size of the optimized replenishment lot size to the supplier.	Strategic Importance of Customer	Strategic attractiveness of the customer based on expected growth, ease of partnering, etc.
Supplier Relationship Type	Relationship types, which can range from open market buying, to contractual, to strategic.	Demand Variability	Monthly variation in order volumes, based on measures of average and standard deviation.
Part Life Cycle Phase	Life cycle phases include prototype, introductory, ramp-up, maturity, decline, phase-out and scrap.	Interrelation with Other Segment Businesses	Impact of gained or lost parts sales on other related businesses, such as service.

Figure 9: Several segmentation criteria were initially chosen, but only those that created new insights about parts management were applied.

To make the negotiations as painless as possible, a menu of ready-made solutions was presented to each supplier.

3. All criteria must create new insights about a group of parts that would aid in planning. For example, TruckCo's standard pricing across all items had given most parts a consistent gross margin regardless of sales price. Unit profit was therefore discarded because it was not insightful.

The second step introduced an extensive data modeling exercise. To collect the relevant demand and supply data needed for each part, extracts were taken from the current planning system. The modeling required a dedicated PC workstation, fortified with a portable memory storage device, a high-powered processor and relational database software. The parts were then segmented.

It was tempting to create several different parts classifications: If two-by-two matrices are used, creating just two of them will produce eight classifications. Generally, however, this is about four or five too many: A new grouping should only be created if it is to be managed in a way that is completely different from other groupings.

The third step is where the science of scientific service-parts management becomes relevant. Referencing advanced material management techniques, the team assigned a comprehensive planning model to each classification. The planning model included the following elements:

- **Deployment basis:** Determines target stocking levels for base stock (if applicable) and safety stock. Choices include simple time-supply methods, such as weeks forward coverage (WFC); traditional methods, such as the base stock model; and more advanced algorithms for abnormal demand distributions, such as the (S-1, S) model.*
- **Replenishment basis:** Determines the optimum lot size and timing for network and supplier replenishment orders. Choices include reactive economic order quantity (EOQ) models and proactive, time-phased replenishment planning methods (time-phased replenishment planning, similar to distribution requirements planning).

*"S" stands for inventory level in stocking algorithms. There are two parameters in these algorithms: inventory level and order quantity (A, B). In this case, (S-1, S) is a stocking model where the system will order one unit (S) when one unit is used and falls below the level of S; this is also called "issue one, replace one."

Classification Name: "The Disrupters"

Criteria Values	Planning Model
Demand Volume: Very Low	Replenishment Basis: Sell One, Buy One
Demand Variation: Very High	Deployment Basis: (S-1, S) Stocking Model, Continuous Review
Supply Availability: Low	Managerial Review Policy: Once per Month
Standard Cost: High	Forecasting Basis: Time Series with Experiential Override

Figure 10: A comprehensive planning model was assigned to each classification. Demand variation was defined using the coefficient of variation (CV), a ratio of the standard deviation of annual demand to the average of annual demand (in units).

Supply and demand intelligence is quickly and formally shared across the departments. As a result, GSPO's executive team has a new level of confidence that the monthly purchase orders, network replenishment orders and demand forecasts will best balance supply and demand.

- **Managerial review policy:** Determines the frequency and level of manager review for a SKU or classification. Choices include daily-weekly or weekly-monthly.
- **Forecasting basis:** Determines the class of forecasting model to be applied to a SKU or classification based on demand. Choices include naïve (time series) models, more advanced regression modeling for slow movers and experiential (human-based) processes for unknowns.

Figure 10 presents one classification that the analytical exercise produced, along with its aligned planning model.

To operationalize this concept, the team had to complete three tasks: 1) update parameters in the current parts-planning system for each SKU; 2) institute a classification process for each new SKU so that it is aligned to the right planning model; and 3) drive these operational changes down to the depot level. This latter step is still under way, and it is being rolled out to each of TruckCo's six North American parts depots. During this rollout, the project team is training depot personnel on the new methods, implementing new cycle counting and control methods, and scrapping obsolete parts.

Results Achieved

GSPO began realizing significant benefits seven months after the improvement strategy launch. Supply and demand intelligence is quickly and formally shared across the departments. As a result, GSPO's executive team has a new level of confidence that the monthly purchase orders, network replenishment orders and demand forecasts will best balance supply and demand. The SRM team has adjusted (or negotiated agreements to adjust) 10 supplier contracts with terms and conditions more favorable to GSPO. Additionally, the depot rollout team has educated hundreds of planning and depot personnel on the new planning models and implemented their standard operating procedures.

To formally execute and track the progress of the two projects, the project team created a monthly S&OP process to bring together procurement, materials management, sales and marketing, product line management, and finance. The S&OP teams have held five successful monthly meetings and prepared all of the associated data.

Tangible dollar and operating benefits are another success story. For the pilot SKUs that have been migrated to their new planning models, both service and inventory turns have shown monthly improvements. The depot rollout team has scrapped more than $35 million in obsolete parts; analysis by TruckCo's finance department expects this to result in a $5 million to $7 million cost-avoidance benefit, due to reduced double handling, reduced insurance and taxes, and increased storage capacity. In some cases, sale of the parts on secondary markets exceeded their book value, resulting in additional cash flow. Also, for the pilot SKUs, the percentage of split shipments has fallen below 10 percent of all pilot orders, which is considered an acceptable level. This has increased direct labor efficiencies for those depots and caused a drop in dealer outbound nonrecoverable freight charges of approximately $1.5 million. These direct benefits are significant, given that they were achieved within the first half of an 18-month implementation. Accordingly, GSPO is excited that the original business is on track to being met.

It's clear that the next wave of value for big iron OEMs resides within the service supply chain. Managers with the vision to act now may enjoy the same type of competitive advantage garnered by early adopters of product supply chain principles, such as General Electric.

The Path Forward

More companies are entering the race to build their service management capabilities. Those with a legacy of service competence (such as financial service, food service and healthcare service providers) may find this to be a simple process. However, many OEMs—especially those in the big iron sectors—potentially face a more challenging environment. Historically, their competencies have been focused on designing, manufacturing and selling physical products—and not on surviving in the sometimes—ethereal service world.

Managing the service supply chain requires radically different skills and capabilities from the product supply chain. Notable differences include:

- **Stochastic demand:** Parts and service demand are driven by the unpredictable event probabilities of the field assets and customers, which makes it very difficult to forecast and manage.
- **Unbuffered demand:** Unlike production work orders, service orders cannot be queued into a master production schedule with a six-week frozen time fence. Nor can service outputs be stored in finished-goods inventory awaiting customer demand.
- **Supplier delivery performance:** For many OEMs across all industry types, lead time and fill-rate performances of external suppliers can be notoriously substandard. Lead times of six months or greater and order fill rates of less than 60 percent are not uncommon.
- **Regulatory requirements:** For some products, legal requirements are key to determining the active life of their service parts. This, in turn, drives stocking quantities and ultimately creates "built-in" obsolescence.
- **Proliferated planning requirements:** Planning at the end-item level for an OEM service business can mean managing individual forecasts, deployment and replenishment plans for 500,000 SKUs without the benefit of aggregating tools, such as a planning bill of materials or a forecasting pyramid.

Regardless of these inherent difficulties, it's clear that the next wave of value for big iron OEMs resides within the service supply chain. Managers with the vision to act now may enjoy the same type of competitive advantage garnered by early adopters of product supply chain principles, such as General Electric.

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About Accenture

Accenture is the world's leading management consulting and technology services company. Committed to delivering innovation, Accenture collaborates with its clients to help them realize their visions and create tangible value. With deep industry expertise, broad global resources and proven experience in consulting and outsourcing, Accenture can mobilize the right people, skills, alliances and technologies.

With more than 75,000 people in 47 countries, Accenture works with clients in nearly every major industry worldwide. Through the integration of consulting and outsourcing, Accenture:

- Identifies critical areas with potential for maximum business impact.
- Innovates and transforms the processes in those areas.
- Delivers performance improvements and lower operating costs by assuming responsibility for certain business functions or areas—and Accenture holds itself accountable for results.

Accenture generated net revenues of $11.6 billion for the fiscal year ended August 31, 2002. Its home page is www.accenture.com.

The Accenture Supply Chain Management service line helps clients plan and implement new operating models to enhance revenue, reduce cost, and improve asset productivity and customer service. In particular, we combine our deep skills and leading-edge approaches in supply chain planning, manufacturing and design, procurement, fulfillment—and new models such as supply chain synchronization, outsourcing and supply chain value transformation—to dramatically improve our clients' overall competitive advantage.