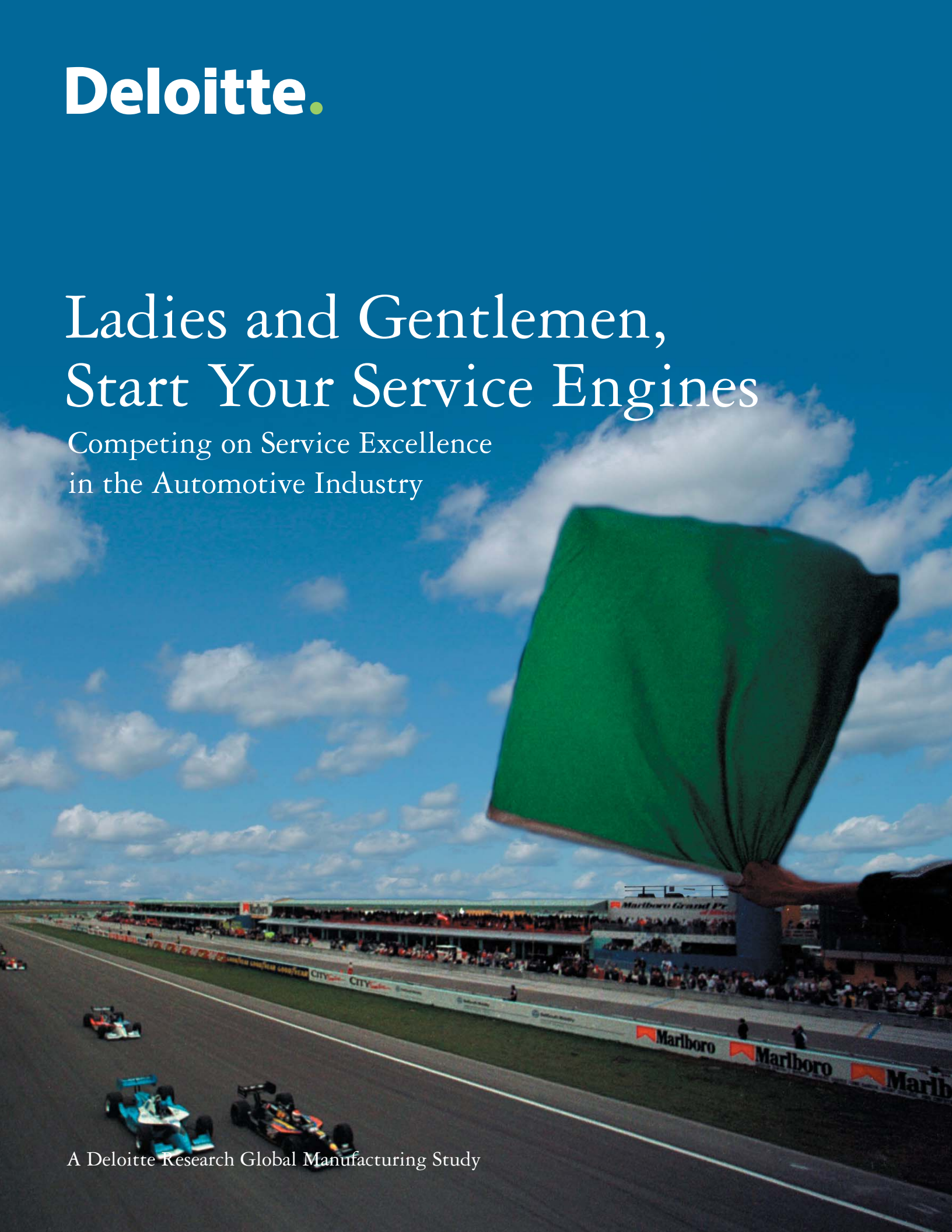


Deloitte.

Ladies and Gentlemen, Start Your Service Engines

Competing on Service Excellence
in the Automotive Industry



A Deloitte Research Global Manufacturing Study

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Introduction

Automotive companies are looking for growth and profits in all corners of the globe and have invested billions of dollars in improving product quality, supply chain efficiency, and demand management. They, however, often neglect a huge opportunity much closer to home—in their own service businesses.¹

According to our ongoing Global Service and Parts Management Benchmark study covering many of the world's largest manufacturers of automotive and commercial vehicles, the service and parts operations are on average 54 percent more profitable than the main business and account for an average of 36 percent of revenues.² As a result, service profits contribute more than 46 percent of total profits among the automotive businesses benchmarked.³

Automotive companies that capture the service business—and most importantly, keep it after warranties expire—gain not just in sales and profit, but also in reduced costs and greater customer satisfaction and loyalty. Yet, most companies have a long way to go before they can harvest the immense potential of service and parts sales.



Our research suggests the following key success factors for getting the service engines started and maximizing the value from service business within the automotive sector:

1. Push harder to integrate service and parts into the corporate strategy, not as a cost center or even a “cash cow,” but as a profitable growth leader. This could mean rethinking basic business assumptions and building a growth business with an effective service marketing and sales organization, more sophisticated service network design, and a “design for service excellence” program integrated with the rest of the business. The sky is the limit.
2. Be more aggressive in planning, managing, and monitoring the service business. Everything—forecasting, supply chain visibility, and on-time delivery—can be improved through better processes and technologies.
3. Deliver as promised, one customer at a time. It can be a major differentiator for improving customer satisfaction, loyalty, sales, and profits. The reason is that just one quarter of automotive companies benchmarked deliver parts on schedule more than 96 percent of the time. And only one quarter say that more than 95 percent of their service orders are resolved and closed on the first call.
4. Reduce structural costs by implementing the concepts of lean distribution. Our data shows that the best companies spend 10 percent or less of net sales on logistics. For 25 percent of benchmark survey respondents, however, logistics cost 21 percent or more of net sales and were a major drain on profits.
5. Finally, make it easier for dealers and customers to do business with you; through better service and parts management focus come higher sales, which mean short-term profit as well as long-term customer loyalty.

Ladies and Gentlemen, Start Your Service Engines⁴

“A business absolutely devoted to service will have only one worry about profits. They will be embarrassingly large,” Henry Ford said. Decades later, many companies are still struggling to heed his advice, our research shows.

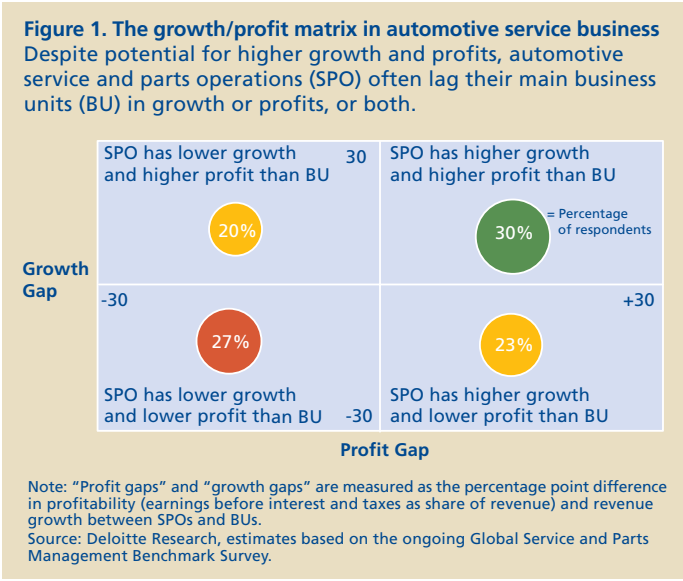
To date we have benchmarked the service businesses of more than 120 of the world’s largest manufacturing companies whose combined revenues reach more than US\$1.5 trillion. In the automotive and commercial vehicle industry, we have studied the strategies, operations, and processes, as well as the tools and technologies, being adopted to drive service excellence across more than 30 of the world’s largest automotive companies. By exploring the factors underlying success in the global automotive industry, as well as in other industries, we are able to provide a perspective on the challenges and opportunities for building and sustaining profitable growth through excellence in service and parts management.⁵

For many of the world’s largest automotive and commercial vehicle companies, aftermarket service and parts operations essentially define the business. Some companies have built the reputation of their brands and their business models on the back of excellence in service and parts management. For Lexus, the luxury-vehicle division of Toyota Motor Corporation, service excellence helped propel the upstart brand to market-share leadership in North America less than two decades after its launch in 1989.⁶ For Hyundai Motor Company and Kia Motors Corporation, the emerging automotive giants based in South Korea, service parts management, through Hyundai Mobis’ Service Parts Sales Business, is an integral part of the corporate strategy. As many vehicles are sold with warranties of up to 10 years/100,000 miles, the global service and parts operation must function at the highest level of efficiency to avoid customer service problems, warranty costs, and brand damage.

The Impact of Services on Profitability and Growth

The automotive service business typically is a more profitable operation than the primary product business. Our analysis suggests that service and parts sales account for an average of 36 percent of total sales across the automotive and commercial vehicle businesses benchmarked. Furthermore, the average profitability of service and parts operations (SPOs) among those companies is more than 53 percent higher than overall business unit profitability, with service and parts profits accounting for an average of 47 percent of total profits of the business units.⁷

The total impact of the service business, however, varies dramatically across the companies benchmarked. A majority are struggling to join the service revolution. Despite the many opportunities for improvement, about half the service businesses benchmarked have profit levels and revenue growth rates lower than or on par with their business units (Figure 1). For about one quarter of the companies, both growth and profitability of their service business lag the main business. The missed opportunities for improvement are significant.



Companies often fail to capture even the market for servicing their own installed base of products—the “captive” service market. The median captive market share of the automotive companies benchmarked is just 45 percent of “pure” services, such as field service repairs, and about 75 percent in spare parts. For numerous companies these captive market shares are much lower. For example, many automakers’ spare parts sales are heavily concentrated on supplying parts to authorized dealers for vehicles during the manufacturers’ warranty period, which typically covers 3-5 years or so. But as the vehicles age and the warranties expire, automakers’ captive market shares for parts typically drop just when the need for parts and service (and the profit potential) increases. Without a warranty in place, consumers shop around for the best value in parts and service. Competitors attack the customer base and manufacturers (and dealers) lose out on a large market opportunity.

In addition, the total market potential—which also includes the potential of selling services, parts, and accessories to customers who did not buy the original product (the “non-captive” market)—is typically two to ten times larger than the captive market. Our analysis shows that the service businesses of most companies today reach only a small share of this market.

Some companies have grabbed these growth opportunities with gusto. Caterpillar has extended its internal excellence in service parts management and logistics to external customers through the creation of Cat Logistics, thereby building a global growth business and capturing a much larger share of the available market for those types of business services.⁸ Since its inception in 1987, Cat Logistics has achieved remarkable success. Today, Cat Logistics has more than 9,000 logistics professionals operating in over 100 locations across 25 countries and 6 continents, managing more than 18 million stock-keeping units (SKUs), and shipping more than 160 million orders and 16 billion pounds of freight per year. Its impressive client list includes companies such as DaimlerChrysler, Ford, Saab, Toshiba, and Honeywell, and the growth opportunities are large. According to Jim Owens, chairman and chief executive officer of Caterpillar, “Cat Logistics has been generating growth of 25 percent annually in revenues from external customers, and massive opportunities remain for creative third-party logistics providers in this \$170-billion industry.”⁹

Given that most companies have yet to fully exploit very large opportunities, the growth potential of the service business often will be significantly higher than that of the primary business. Many companies, however, are late out of the gate.

It is not just about growth and profit opportunities. By neglecting their service and parts business, automotive companies jeopardize their business models. Inviting competitors to exploit captive markets for service and parts is a dangerous game. Service is a crucial link to customer loyalty and retention. As manufacturers face increasing pressure from lower-cost competitors, the link to the final customers will become the ultimate battleground for competitiveness. If established manufacturers lose the service business battle, the field will be left wide open for emerging low-cost competitors.

Furthermore, major automotive companies are gradually outsourcing pieces of their core manufacturing operations, including parts production and assembly and even parts of design and product development. They are, in effect, relying more and more upon the success of their customer-facing, service-oriented businesses, which often lack the capabilities needed to create and sustain competitive advantage.¹⁰

Finally, success in servicing a sold product is typically a crucial component in building a manufacturing brand. Failure in the service business—through unresponsive customer complaint handling, inefficient warranty management, or reactive, slow, and expensive service delivery—can mean the slow (or sometimes not so slow) death of a brand.

The costs of missing out on the service revolution, indeed, can be enormous.



Qualifying for the Service Race

Despite the impressive statistics on the impact of the service businesses on overall business performance, our analysis suggests the untapped potential for growing profits through the service business is immense. While the challenges for achieving service excellence are legion, a review of them—from service strategy and business design to operations management and service execution—indicates the levers automotive companies can pull to shift the service engines into high gear.

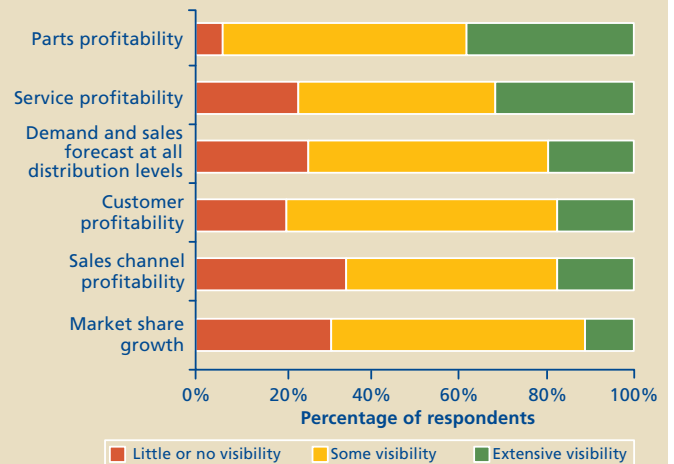
Service Strategy and Business Design: Laying the Foundation

Most companies struggle to come up with a strategy and business design that can build service excellence. Few have sufficient insight into the barriers and opportunities for driving profitable growth through services. Yet some companies make the service business central to their corporate strategy: they design the service business around customer requirements in order to drive customer satisfaction, loyalty, and business performance.

At the heart of the problem is a lack of insight into the real opportunity. For example, few of the automotive companies benchmarked said they had extensive visibility into service profitability (22 percent), parts profitability (38 percent), sales channel profitability (16 percent), customer profitability (16 percent), and market share growth metrics (9 percent) (Figure 2). This makes it difficult, at best, to develop the right strategies, identify the right priorities, and invest sufficiently in the service business.

While 56 percent of automotive executives say that continuous optimization of the overall supply chain design of the service business is of the highest importance over the next three years—the highest ranking among all the factors studied in this area—only 22 percent have high performance in the area today (Figure 3).

Figure 2. Automotive companies lack strategic visibility on where the value is in services and parts

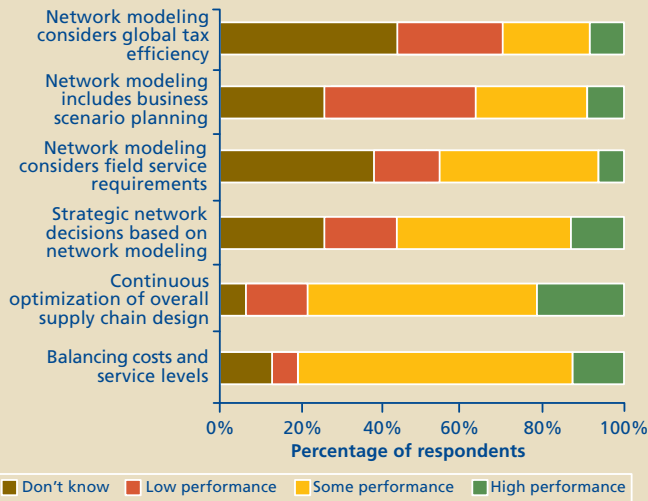


Source: Deloitte Research, estimates based on the ongoing Global Service and Parts Management Benchmark Survey.

Similarly, few respondents say they have achieved high performance in balancing cost and service level to customers (13 percent), and building scenario planning into network modeling (9 percent). Only 9 percent of respondents say they are doing well in building global tax efficiency into network modeling, and—rather unsettlingly—another 44 percent said they did not know how they were doing in this area. Taking a holistic view of the business, including considering issues of tax and other regulatory and compliance issues, is of crucial importance to most complex companies struggling to get value out of their global investments.¹¹ But automotive companies recognize the future importance with more than half (56 percent) giving the highest rating to continuous optimization of overall supply chain design over the next three years.

Building service excellence into the strategy and design of the business is difficult. Building it into the product design is perhaps even harder. It is, however, of crucial importance in the automotive industry. New wireless technologies has opened

Figure 3. Optimizing global service networks is a challenge for most automotive companies



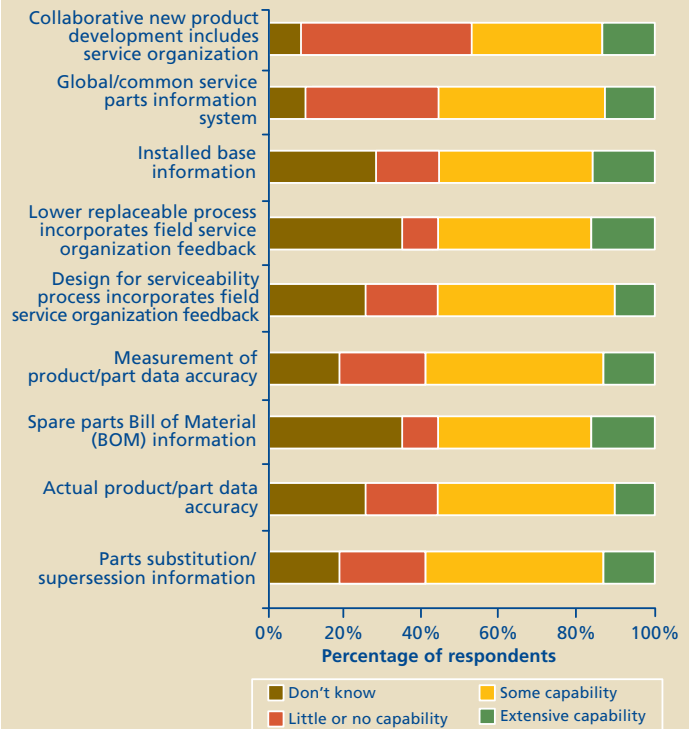
Source: Deloitte Research, estimates based on the ongoing Global Service and Parts Management Benchmark Survey.

up for new service opportunities. General Motor has built the world's largest telematics company, GM OnStar, in an effort to provide customer with real-time in-vehicle services and remote sensing and diagnostics. The OnStar Vehicle Diagnostics system provides customers with both instant and periodic diagnostic checks of key areas—such as engine and transmission, brake system, and air bags—and sends status reports to customer via e-mail so they can schedule any needed service visits.¹²

Yet only a few companies have effectively built service management into product innovation and lifecycle management decisions (Figure 4). Just 16 percent of companies rated as high their capabilities for using installed based information. This is a fundamental building block in optimizing the service business due to the economies of managing inventories and designing new products in a way that makes them easier and more economical to service as part of the total installed base.

Another factor that frequently contributes to sub-optimal service businesses is ineffective organizational design, with a low level of investment in the people and competencies needed to drive top performance. Some companies invest up to 10 times more in their sales people than in their service staff. Given the strategic importance, profitability, and growth potential of the service business relative to those of the overall business, the ability to attract and develop the right talent for the service business should be a key issue for top management.¹³

Figure 4. Design for service excellence is a big opportunity in the automotive industry: Few companies have extensively adopted leading practices



Source: Deloitte Research, estimates based on the ongoing Global Service and Parts Management Benchmark Survey.

Service Operations Planning and Management: Enabling Service Excellence

In operations planning and management, companies with complex service operations—such as those with thousands, or hundreds of thousands of parts, with services that need to be delivered around the clock and often in remote parts of the world, and with service lifecycles that can stretch for decades—often struggle to realize service excellence. A lack of capabilities for planning, managing, and monitoring the service business more effectively is a problem for many of the companies we have studied.

Planning is a challenge. Among the companies responding, the median forecast accuracy for parts demand is 80 percent; for a quarter of the companies it is lower than 30 percent.¹⁴ Even less encouraging: nearly 60 percent of the companies surveyed are unable to report on the forecast accuracy for the service and parts business, suggesting significant problems in managing demand, inventories, and capacities.

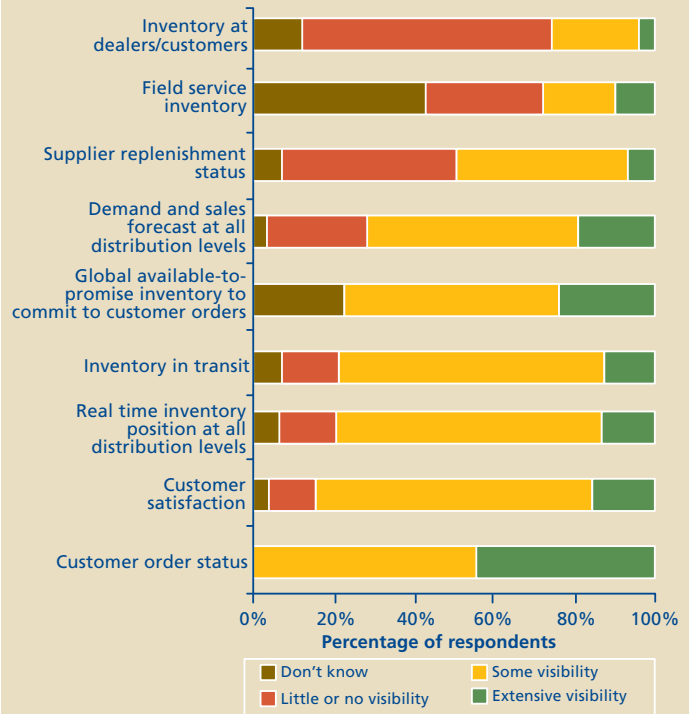
A majority of companies considered supplier responsiveness (78 percent of respondents) and long lead times (83 percent) as “moderate to major” barriers to service excellence (Figure 5).¹⁵ With median on-time delivery rates from suppliers at just 80 percent, this is understandable.

Furthermore, the vast majority (78 percent) of the automotive executives surveyed indicate that inadequate information systems are “moderate to major” obstacles to service excellence. Nearly seven out of ten companies point to supply chain visibility and nearly two-thirds to problems with data management (master data, etc.) as “moderate to major” barriers to excellence in service and parts management.

Executives at many companies said they had no or very limited visibility into key operational metrics such as inventory at dealers/customers (63 percent); supplier replenishment status (44 percent); and demand and sales forecast at all distribution levels (25 percent). (See Figure 6.)



Figure 6. Lack of operational visibility is hampering efficient operations in the service business



Experiences at companies such as Caterpillar show that processes and systems that create visibility across the supply and distribution network are fundamental to building service excellence. As far back as the 1970s, Caterpillar built a central global database for tracking inventory across its network, initially with a focus on parts originating from Caterpillar’s central distribution centers. In 2002, the system was extended to include parts obtained locally to ensure global visibility to all parts in the distribution network.¹⁶ With more than 600,000 spare parts and components, products that often need service for 40 years or longer, and complex global flows of parts and information, no improvement comes easy. But visibility provides a cornerstone to make it happen. With the benefit of improved visibility, combined with better processes and better technologies, Caterpillar has since the late 1980s been able to reduce its service parts inventories by half while improving its already highly regarded customer service. Caterpillar can fill and ship an order in 24 hours or less 99.7 percent of the time. For Caterpillar, customer service levels rate as the top factor in generating repeat business. In addition, these improvements are saving the company more than US\$460 million annually.

Despite impressive results to date, Caterpillar is not resting on its laurels. Recognizing that its core competency is supply chain management and logistics and not software development, the company is developing its next-generation global service and parts management system in joint collaboration with SAP, Ford Motor Company, and Deloitte Consulting.¹⁷

Service Execution: Delivering Service Excellence One Customer at a Time

In execution, the “last mile” to the customer where battles for customer loyalty are won or lost, the majority of companies are still unable to provide customers with excellent and cost-effective service.

Underlying the challenges of execution are the common problems of low visibility; lack of timely and accurate product, inventory, and transaction data; ineffective process collaboration internally and with customers and suppliers; and sub-standard capabilities for optimizing and differentiating customer service levels based on customer requirements.

In the face of all of these challenges, the likelihood of being able to respond appropriately to customer demand is quite low. Overall, our analysis of the benchmark results suggests that customers of the automotive service businesses studied are likely to get exactly what they want, at the right time and place, less than 56 percent of the time—a dismal performance in a global economy where customers have more options and more information than ever before to prompt a switch to competitors’ products and services.¹⁸

Ensuring service excellence, however, is core to the business model for many companies such as Hyundai Motor Company and Kia Motors Corporation where service guarantees such as extended warranties are an essential part of the value provided to the customer. Hyundai Motor Company and Kia Motors Corporation sell their passenger vehicles with warranties of up to 10 years/100,000 miles in key markets around the world. To do this in a cost-effective manner, not only must the cars be of high quality, but the service and parts operation must operate at the highest level of efficiency. Hyundai Mobis’s Service Parts Sales Business is responsible for supplying service parts to Hyundai and Kia Motors vehicles worldwide. This involves stocking more than 890,000 parts for 137 vehicle types. It has built a US\$55 million, 2.2 million square-foot spare parts center in Asan, south of Seoul, to help do this more effectively and support its global distribution network.¹⁹ The center is piloting the use of item-level radio-frequency identification (RFID) tagging coupled with a central computer system that uses artificial intelligence for managing and optimizing the spare parts business. Customers can, in real time, remotely track the status of the shipment at any time between order and delivery.²⁰ Capturing a larger share of the servicing of Hyundai and Kia’s more than 24 million vehicles in operation worldwide is a crucial part of the growth strategy of Hyundai Mobis Service Parts Sales Business.²¹

Indeed, there are great opportunities for automotive companies to improve what should be an engine for profitable growth in many or most manufacturing organizations. Some companies are championing the service revolution to drive performance. Twenty-five percent of the benchmarked companies report a 98 percent or higher on-time delivery performance to customers.

Putting the processes and technologies in place for delivering service excellence—one “perfect” customer interaction at a time—is a significant challenge. Customers keep raising the bar for service excellence by requesting shorter lead times, higher service levels, lower cost, and better customer service support. Not surprisingly perhaps, few automotive companies report exceptional performance on their goals for customer satisfaction (6 percent) and customer loyalty and retention (3 percent).

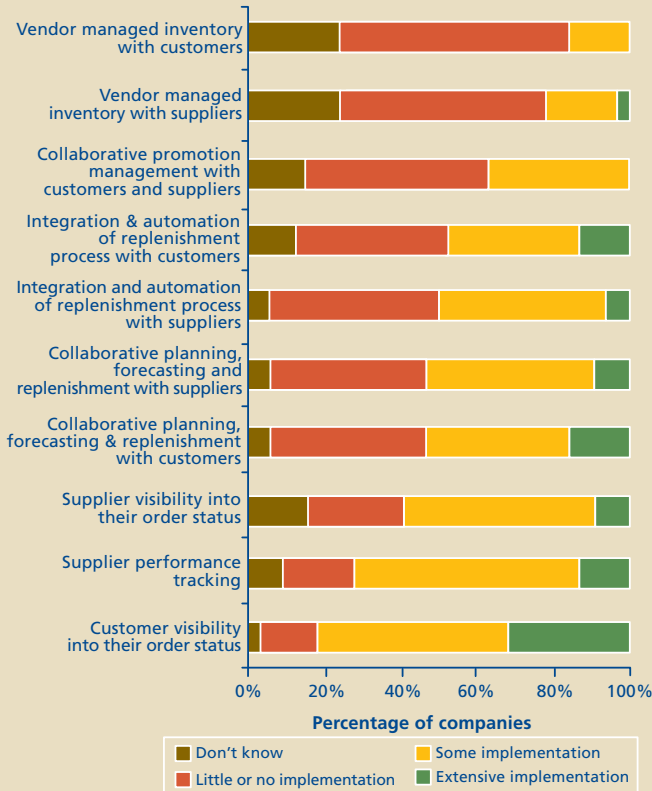
While the challenges are numerous, our research suggests that companies can make strategic and operational investments in processes and technologies that will enable them to overtake the competition and drive continuous improvement in the operational and financial performance of their global service businesses.

In the area of process collaboration, a majority of automotive companies benchmarked have significant work remaining on building the road for delivering service excellence. The strongest capabilities developed so far are in customer visibility. Nearly a third of the automotive companies benchmarked provide customers with extensive visibility into their order status—a capability that can improve the customer experience and lower customer service costs (Figure 7). On the supplier-facing side, however, just 13 percent have achieved similar levels of capabilities.

In addition, only a few companies have implemented extensive collaborative planning, forecasting, and replenishment (CPFR) with customers and with suppliers. In fact, more than 50 percent of executives say they have not implemented vendor-managed inventory practices with customers and with suppliers, and another quarter say they don’t know where they stand in this regard.

Despite the lack of adoption of best practices across a number of companies, leading automotive service businesses are adopting collaborative processes that are well-documented, proven, and ready for implementation.²² Indeed, our analysis indicates a strong relationship between the extent of implementation of processes—such as collaborative planning, forecasting, and replenishment with customers—and the benefits achieved from the implementation. Across the service businesses benchmarked, the more extensive the level of implementation, the higher the benefits reported from adoption of key processes.²³

Figure 7. Adoption of better collaborative processes still has a long way to go in most automotive service businesses

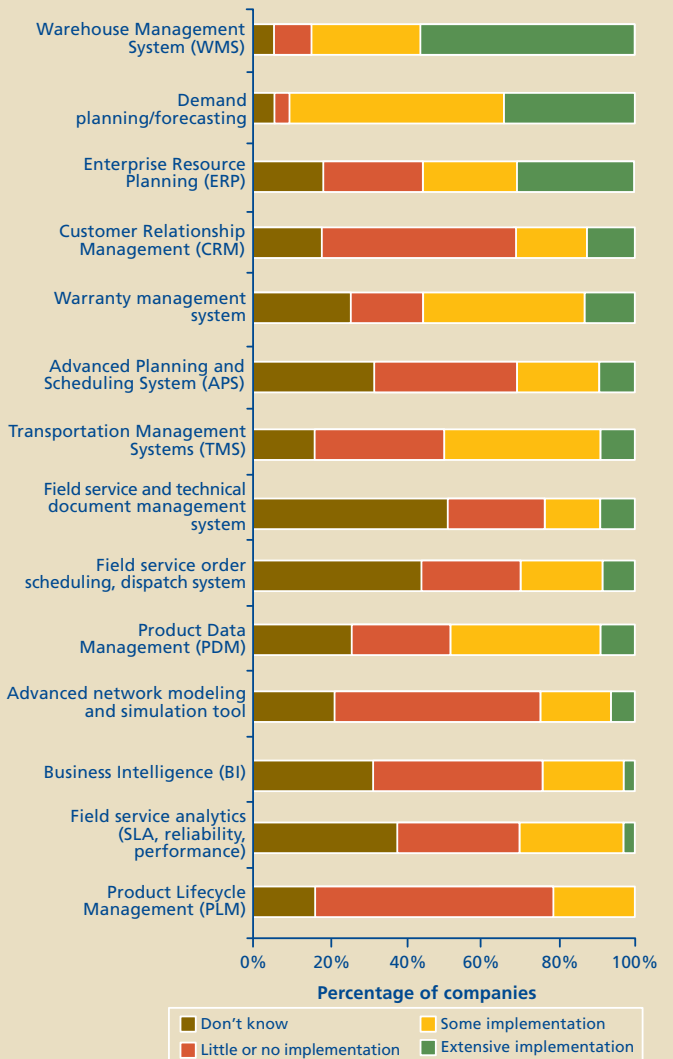


Source: Deloitte Research, estimates based on the ongoing Global Service and Parts Management Benchmark Survey.

The Parts and Accessories division of Volkswagen AG (VW), the €104.9 billion automobile manufacturer, experienced this firsthand in its North American operations.²⁴ With supplies coming from Europe and South America, more than 160,000 different parts, more than 1,000 dealers, and more than 12 million order line items per year, it is perhaps no surprise the company was struggling with excessive and often incorrectly located parts inventories across the distribution network, and low customer order fill rates. Volkswagen resolved to assess the entire service parts network. By deploying a new business design, and processes and planning techniques (including lean warehouse management), VW has reduced its structural cost, improved inventory management and productivity, and dramatically increased customer service levels—all within just six months. Customer order fill rates directly from inventory have been increased from 74 percent to 94 percent and fill rates using the entire network have increased to 98 percent. Beyond the hefty improvement in customer service levels, VW is reporting reductions in inventory and warehousing costs to the tune of more than US\$30 million per year.

In the technology area, many companies are neglecting to upgrade their infrastructure to enable differentiating performance in the service business. In fact, automotive executives frequently cited inadequate and inflexible information systems as a top barrier to service business excellence (Figure 5). This is not surprising. Across a range of capabilities, most companies still have considerable ground to cover to fully exploit the power of new technologies and systems.²⁵ While enterprise resource planning (ERP) software, warehouse management systems (WMS), and demand planning and forecasting software tools have been adopted extensively by a third or more of the automotive companies benchmarked, many other tools and technologies have yet to gain acceptance (Figure 8). Few service operations have extensive implementations of systems for warranty management (13 percent), customer relationship management (13 percent), product data management (9 percent), advanced planning and scheduling (9 percent), and transportation management (9 percent).

Figure 8. Technology adoption in automotive service businesses behind the curve



Source: Deloitte Research, estimates based on the ongoing Global Service and Parts Management Benchmark Survey.

The adoption of radio-frequency identification (RFIDs) and related technologies for real-time sensing and communication is still only nascent in most of the automotive companies benchmarked. Executives said barriers to adoption of RFID include issues relating to the costs and benefits of adoption, technology maturity, and systems integration and industry communication standards. Interestingly, few companies saw significant problems around sharing information with suppliers and customers around their service business, indicating a potential for taking a collaborative approach to adoption of these technologies.

While most companies are taking a “wait-and-see” approach, a select few have started significant deployment of leading-edge technologies, such as RFID and other sensing and communications technologies, to support integrated product and service strategies. They report some to major benefits in areas ranging from warehouse asset utilization (for example, storage space/equipment) and process optimization in the warehouse, to improved traceability of products and management of product recalls and related warranty and claims management, as well as reduced lead times and improved customer service.

The overall picture, however, is that many automotive service businesses are lagging behind in the adoption of IT. In the past they may have blamed this on a lack of needed capabilities in commercial applications available in the market. Those excuses, however, are starting to disappear. Information systems for designing, planning, managing, and executing the service and parts business are maturing rapidly and can now support most of the requirements of even the world’s largest and most complex service businesses. These systems are no longer the biggest potholes on the road to service excellence that they were 10 or 15 years ago. In fact, without sufficient technology adoption it will be increasingly difficult, if not impossible, to manage and optimize the service business as customer requirements increase and the service business grows more complex.



Conclusion: The Service Race is on—Changing Automotive Competition

There are a number of reasons why automotive companies need to prioritize the service business among their strategic initiatives and investments.

First, the business of many global automotive companies is under attack because of changing customer demands, maturing home markets, and competition from low-cost manufacturers. These factors are taking their toll on growth and margins in primary product sales and threatening even the service and parts business. In developed markets, main-line products are being commoditized through increased pricing pressures, particularly from the entry of new competitors with lower cost bases. Service businesses are typically more resistant to attack by low-cost competitors because they involve considerable local presence and customer intimacy, which is difficult and expensive to copy by newcomers. In emerging markets, such as China and India, service and parts operations are under attack from price competition, and counterfeit and will-fit (and sometimes “ill-fit”) parts that jeopardize profits, growth, and brand reputation. Protecting the business through service excellence is one way of keeping out the competition while improving customer satisfaction and loyalty.

Second, the increased frequency of new product introductions and shorter life cycles for main products due to product proliferation make service excellence even more important. If not properly managed, the combination of short sales cycles due to rampant product proliferation throughout the automotive industry and long service life cycles is a recipe for escalating costs, parts obsolescence, lost customer focus, and deteriorating customer service quality. Among the benchmarked automotive service operations, the median parts inventory obsolescence rate stood at 5 percent and in many cases exceeded 10 percent or more—a symptom of costly service business problems.²⁶

Third, quality issues and problems with service and parts can extract a staggering toll in terms of warranty costs, brand damage, and lost customer loyalty. While such problems adversely affect the business immediately, it is a long and uphill battle to regain the trust and loyalty of customers and rebuild the brand.

Fourth, service businesses can be very resilient. In times of economic downturn, service and parts sales are often far more robust than the main business. For example, during the economic and financial crisis in Korea from 1997 to 1999, sales of new vehicles by Hyundai and Kia Motors dropped nearly 36 percent, but Hyundai Mobis Spare Parts Sales Business posted a 5.6 percent increase in sales.²⁷

And, finally, the increasing complexity of the business—factors include business expansion into new markets, mergers and acquisitions, continued outsourcing of parts production, logistics and service delivery, more and more new products, and the combination of short initial product sales cycles, long service cycles, and more demanding customers—will make the business challenges and risks even more daunting.²⁸



Appendix: Global Service and Parts Management Benchmark Respondent Profile

This study is based in part on the ongoing Deloitte Global Service and Parts Benchmark Survey with more than 120 companies and business units participating to date across Europe, North America, and Asia-Pacific. The automotive and commercial vehicles industry account for more than a quarter of the companies studied.

In the automotive sector, 68 percent have corporate revenues of more than US\$1 billion; and 16 percent have revenues ranging from US\$600 million to US\$1 billion. Of the automotive service businesses benchmarked to date, 56 percent have global coverage, 25 percent have regional (multinational) coverage, and the remaining 19 percent have national coverage.

Endnotes

- ¹ In this study we use the terms “service business,” “service operation,” “service and parts business,” and “service and parts operation (SPO),” and other similar terms interchangeably, unless otherwise indicated.
- ² Companies benchmarked in the automotive and commercial vehicles industry include original equipment manufacturers (OEMs) of passenger vehicles, commercial vehicles and recreational vehicles; construction and agriculture equipment; suppliers; wholesalers and distributors; and other automotive companies.
- ³ Profitability is measured as earnings before interest and taxes (EBIT) as a percentage of sales revenue.
- ⁴ As many readers will know, the title is a slight modification of the *Indianapolis 500* race call for drivers to start their engines.
- ⁵ Service and parts management refers to the management of a service and parts operations after the initial sale of the main products are made, and includes installation sales and services, spare parts distribution and sales, and post-sales services.
- ⁶ See Ian Rowley, “Lexus to the Rescue,” *BusinessWeek*, July 11, 2005. See also Frederick Reichheld, *The Loyalty Effect: The Hidden Effect Behind Growth, Profits, and Lasting Value* (Boston, MA: Harvard Business School Publishing, 1996). Another example is Saturn’s prowess in service and parts management, which is generating higher customer satisfaction, loyalty and, ultimately, retention of profitable customers; see M.A. Cohen, C. Cull, H. Lee, and D. Willen, “Saturn’s Supply Chain Innovation: High Value in After-sales Service,” *Sloan Management Review*, summer 2000. For more on the impact of customer loyalty on profitability, see also Deloitte Research, *Making Customer Loyalty Real: Lessons from Leading Manufacturers* (New York, 1999).
- ⁷ Profitability is measured as earnings before interest and taxes (EBIT) as a percentage of sales over the last fiscal year. Revenue growth is measured as the average annual increase in sales revenue over the past three fiscal years. Other research suggests that “Aftermarket service and parts account for 20 percent to 30 percent of revenues and about 40 percent of profits for most manufacturers”; see Tim A. Minahan, “Unlocking Value and Profits in the Service Chain Service Parts Management,” Aberdeen Group, September 2003.
- ⁸ See Michael Schmidt and Steve Aschkenase, “The Building Blocks of Service Excellence,” *Supply Chain Management Review*, July–August 2004.
- ⁹ See *Caterpillar 2004 Annual Report*.

- ¹⁰ See “Extinction of the Predator: The Global Car Industry,” *The Economist*, September 10, 2005.
- ¹¹ See Deloitte Research, *Unlocking the Value of Globalization: Profiting from Continuous Optimization* (New York, 2005).
- ¹² See P. Koudal, H. L. Lee, B. Peleg, P. Rajwat, and S. Whang, “OnStar: Connecting to Customers through Telematics,” Stanford Graduate School of Business Case GS-38, October 2004. See also www.gm.com.
- ¹³ For more on talent management, see Deloitte Research, *Managing the Talent Crisis in Global Manufacturing: Strategies to Attract and Retain Generation Y* (New York, 2007). See also Deloitte Research, *It’s 2008: Do You Know Where Your Talent Is?* (New York, 2004); and Deloitte Research, *It’s 2008: Do You Know Where Your Talent is? Connecting People to What Matters* (Boston, MA, 2007).
- ¹⁴ Forecast accuracy is defined as the “mean absolute percentage error for all forecasted stock-keeping units (SKUs) or parts.”
- ¹⁵ Percentages around barriers refer to the share of respondents rating the barrier 4 or 5 on a five-point scale, where 5 is “major barrier”, 3 is “moderate barrier” and 1 is “not a barrier”.
- ¹⁶ See Schmidt and Aschkenase, “The Building Blocks of Service Excellence,” 2004.
- ¹⁷ *Ibid.*
- ¹⁸ The on-time complete order fulfillment rate (or “perfect order” rate) is calculated as the median order line item fulfillment rate (95 percent) multiplied by the median number of line items per order (11.15) across the automotive companies benchmarked.
- ¹⁹ See “Mobis Opens Logistics Center in Asan. Center dedicated to enhanced after-sales service. W54.7 bil. spent to combine logistics functions,” Hyundai Mobis, June 16, 2005, www.mobis.co.kr.
- ²⁰ *Ibid.*
- ²¹ Estimate. See *Hyundai Mobis Annual Report 2004*.
- ²² Indeed, the value of better processes for managing the service and parts business is well understood. See, for example, Deloitte, *Aftermarket, Afterthought: Getting More Value from Your Service Parts Supply Chain* (New York, 2003). See also Morris A. Cohen and Hau L. Lee, “Out of Touch with Customer Needs? Spare Parts and After Sales Service,” *Sloan Management Review*, winter 1990.
- ²³ For more information, see Deloitte Research, *The Service Revolution in Global Manufacturing Industries* (New York, 2006).
- ²⁴ See *Volkswagen AG Annual Report 2006*.
- ²⁵ Research indicates that spending on service and parts management IT is 60 percent below main line business and that automation of service life-cycle management (SLM) is important. According to one study focused primarily on North American companies, the 65 percent of businesses that have not automated to SLM are twice as likely to lose customers as are SLM leaders; see Marc McCluskey, Judy Bijesse, David O’Brien, and Lindsey Sodano, “Service Lifecycle Management (Part 2): Building a Roadmap for Investments,” *AMR Research*, September 24, 2002. Other analysis suggests that “manufacturers service supply networks are ten years behind their product supply networks in terms of process sophistication and use of packaged applications”; see Brian Albright, “Industry Rises to Aftermarket Parts Challenges,” *Frontline Solutions*, July 2004.
- ²⁶ The inventory obsolescence rate is defined as the percentage of inventory classified as obsolete (non-sellable or out-of-date) on an annual basis.
- ²⁷ See *Hyundai Mobis Annual Report 2004*.
- ²⁸ On the current and future complexity trends, see Deloitte Research, *Mastering Complexity in Global Manufacturing: Powering Profits and Growth through Value Chain Synchronization* (New York, 2003); and Deloitte Research, *Unlocking the Value of Globalization: Profiting from Continuous Optimization* (New York, 2005).

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