

The Deloitte logo is positioned in the top left corner of the page. It consists of the word "Deloitte" in a white, sans-serif font, followed by a small green dot. The background of the entire page is a photograph of a sunset over a body of water, with a dark blue sky and scattered clouds illuminated by the low sun.

The Service Revolution in Global Manufacturing Industries

A Deloitte Research Global Manufacturing Study

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About Deloitte Research

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Executive Summary

“A business absolutely devoted to service will have only one worry about profits. They will be embarrassingly large,” Henry Ford, founder of one of the world’s largest manufacturing companies, once said. Decades later, however, companies are still struggling to heed this advice. Manufacturers are looking for growth and profits in all corners of the globe, but they often neglect the very large opportunities much closer to home—in their own service businesses.¹

Confronted by low-cost competitors, the escalating complexity of their global supply chains, and ever-increasing customer demands, manufacturers ignoring the needs of the service business do so at their peril.² As the basis of competition in manufacturing continues its shift towards service excellence—the ability to drive business performance through excellence in service and parts management—they are effectively putting their entire business models at risk.



Over the last year, we have benchmarked the service businesses of many of the world’s largest manufacturing companies with combined revenues reaching more than US\$1.5 trillion. In industries ranging from aerospace and defense and automotive to high technology and diversified manufacturing, we have studied the strategies, operations, and processes, as well as the tools and technologies being adopted to drive service excellence. By exploring the factors underlying success, 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.³

Across the manufacturing companies we have benchmarked, services revenues today represent an average of more than 25 percent of the total business. In many companies, as for Rolls-Royce plc and Xerox Corporation, the service business contributes 50 percent or more of total revenues.

Even more importantly, the average profitability of the service businesses benchmarked is more than 75 percent higher than overall business unit profitability, and accounts for an estimated 46 percent of total profits generated today.⁴ In fact, in many manufacturing companies there would be little or no profitability without the service business.

Our analysis suggests the untapped potential for growing profits through the service business is immense. But most companies fail to grow their service business. More than two-thirds (67 percent) of companies are growing their service businesses at the same rate as, or slower than, their overall business. In essence, they are managing a high growth potential “star” business as a slow-growth “cash cow.” The median company benchmarked secures only 40 percent of the after-sales service market and 75 percent of the after-sales spare parts market in servicing its own installed base of

products (the “captive market”). For many companies, such as automotive original equipment manufacturers (OEMs), these shares are often much lower. In addition, only a few OEMs have made significant inroads in servicing “non-captive” customers—a market that is typically 2 to 10 times larger than the captive market. The challenges are many:

- In **strategy and business design**, most companies struggle to build the foundation for service excellence. Few have sufficient insight into the barriers and opportunities for driving profitable growth through services, which makes it difficult, at best, to develop the right strategies, identify the right priorities and invest sufficiently in the service business. Yet some companies, such as Siemens AG Medical Solutions, 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.
- In **operations planning and management**, companies with complex service operations—those with thousands or hundreds of thousands of parts, services that need to be delivered around the clock and often in remote parts of the world, and service lifecycles that can stretch for decades—often lack the capabilities to realize service excellence. The experiences of some of the world’s leading manufacturing companies, such as Caterpillar, show that persistent investment in, and focus on, improving the service and logistics operations can drive outstanding customer service, resulting in enhanced customer loyalty and a foundation for profitable growth.
- 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. Overall, our analysis of the benchmark results suggest that customers are likely to get exactly what they want, at the right time and place, less than 75 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. 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 consumer.

There are great opportunities for 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 an

on-time delivery performance to customers of 96 percent or higher. Caterpillar—with more than 600,000 spare parts, and an installed base of equipment that often needs service for 40 years or longer—is able to ship its customers exactly what they want, within just 24 hours, 99.7 percent of the time.⁵

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 leapfrog the competition and drive continuous improvement in the operational and financial performance of their global service businesses.

- First, companies can adopt **collaborative processes** across the service supply chain, from suppliers to customers, that are well-documented, proven, and ready for implementation. Indeed, our analysis indicates a strong relationship between the level of implementation of processes—such as collaborative planning, forecasting, and replenishment with customers—with 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. Volkswagen AG experienced first-hand in its North American operations the benefits of implementing robust processes for service parts management. It drove dramatic improvements in customer order fill rates over just six months while reducing annual cost by over US\$25 million.
- Second, **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 weak links on the road to service excellence that they were 5, 10, or 20 years ago. In fact, without sufficient technology support 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. While adoption rates are still abysmally low in many areas, our analysis points toward a strong correlation between information systems implementation and benefits achieved. Some companies, such as Rolls-Royce, are capitalizing on improved technology, sometimes going beyond what would have been thought possible just a few years back.

With profitability and growth levels in many cases far exceeding the main business, it is abundantly clear that the service revolution in global manufacturing is well underway. For most manufacturers, it is now a matter of effectively embracing the service revolution or risking being left behind.

Driving Profitable Growth Through the Service Business

For many of the world’s largest manufacturers, aftermarket service and parts operations essentially define the business. For example, for Rolls-Royce, one of the world’s largest jet engine and gas turbine makers, service revenue is about 55 percent of the more than US\$11 billion in total revenues;⁶ and for Xerox Corporation, the US\$16 billion technology and services giant, post-sale and other service revenues amount to more than 65 percent of total sales.⁷

Indeed, findings from our ongoing Global Service and Parts Management Benchmark Survey show that the service business accounts for an average of nearly 26 percent of revenues across the industries we have studied (Figure 1). In 19 percent of the companies benchmarked the service business accounted for 50 percent or more of total revenues (Figure 2).

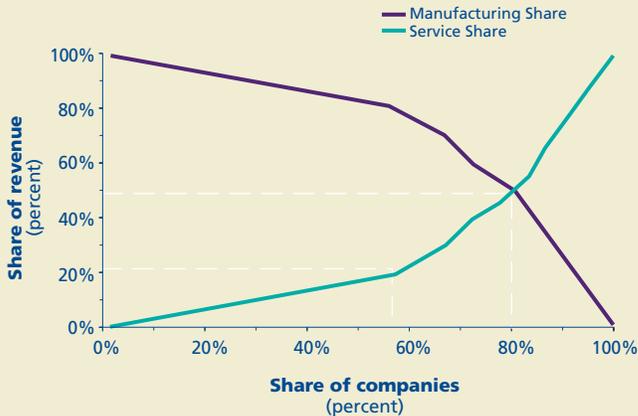
Figure 1: Revenue impact of service and parts business by global industry—select findings

Global industry	Share of service and parts business in overall sales	
	Average (percent)	Top 90 th Percentile (percent)
Aerospace and defense	47%	More than 50%
Automotive and commercial vehicles	37%	More than 50%
Diversified manufacturing and industrial products	20%	More than 50%
High technology and telecommunications equipment	19%	More than 50%
Life sciences/medical devices	21%	More than 50%
All companies	26%	More than 50%

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

Figure 2: Catching up to the service revolution in global manufacturing

The average service share of total sales revenues is more than 25 percent and for many global manufacturing companies benchmarked the service share is larger than 50 percent. Yet, for more than half the companies, the service business still contributes less than 20 percent of total sales.



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

The Role of Service Businesses in Global Industries

These findings are not surprising in light of the crucial role service and parts management plays across industries.

- In **aerospace and defense**, maintenance, repair and overhaul is the cornerstone of selling airframes, jet engines, and many other big-ticket items. Like many other industries, the aerospace and defense industry is moving towards performance-based service and logistics agreements with customers—providing guaranteed availability and reliability of equipment, modules and entire platforms (such as jet propulsion) over an extended period of time. For example, Rolls-Royce has long been focused on selling “Power By The Hour®:” Major airline and defense customers can pay a fixed warranty and operational fee for the hours engines are running, which means that Rolls-Royce must focus on the entire package—products, installation, after-sales maintenance, repair and overhaul (MRO), and overall service and parts management—to ensure profitable growth of its business over the long haul.⁸ While many companies base their aggressive growth plans on securing these types of agreements with customers, their future profitability depends on their ability to deliver the promised service levels in a cost-effective manner, which can be a challenge even for the best companies.⁹
- In **automotive and commercial vehicles**, 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 1989.¹⁰ 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 service and parts operation must function at the highest level of efficiency to avoid customer service problems excessive warranty costs, and sustain profitable growth.
- In the cut-throat **consumer goods** markets, top business performance is often driven by combining product quality and performance with service excellence. Apple Computer is going further by elegantly mixing physical product sales with digital services. Apple’s iPod portable music and video player offering has leapt in just four years from being yet another consumer gadget to block-buster status with quarterly sales reaching more than 6 million units.¹¹ Perhaps more importantly, Apple is selling services with the product to the tune of 2 million music downloads per day while also establishing fast-growing online video sales. Some analysts estimate Apple’s share of the global online music market at an impressive 80 percent or more.¹²
- In **diversified manufacturing and industrial products companies**, such as General Electric, the service business is an integral part of the business in the eyes of the customers. According to Jeffrey Immelt, chairman and chief executive officer of GE, “Services represent about 30 percent of our industrial sales and have the potential to grow at double-digit rates for the foreseeable future. Services are a powerful growth engine because our technology is long-lived and we focus on making the customer more profitable.”¹³ In industrial automation, customers are under pressure to reduce costs and time to market, and to increase quality and safety. At ABB, the response has been to move towards selling “performance service” offerings, which allows the tailoring of services to customers exact needs—from simple, product-focused maintenance and field services to customer-focused services—called “Automation Performance Management”—where ABB guarantees the performance level (and assumes the related risk) of the customer’s automation equipment over its lifecycle—independent of whether it was original ABB equipment or not.¹⁴ Ensuring the right pricing and the cost effectiveness of fulfilling such comprehensive service contracts is bound to set new standards for service excellence in the years ahead.
- In the **life sciences and medical device industry**, the most demanding customers keep raising the bar for service excellence. Customer requests for same-day (instead of overnight or slower) service fulfillment combined with service-level agreements that put the risks (and rewards) on the back of the manufacturer will be more and more common. For some companies, such as Siemens Medical Solutions, these demands typically require the creation of more complex and costly distribution and service network in order to get closer to customers and enable faster response. The enhancements needed in processes and systems for managing and optimizing these networks will challenge even the leading service businesses in the coming years.
- For industrial customers of **high-tech technology and telecommunications equipment manufacturers**, machine downtime can cost US\$100,000 or more per hour. Indeed, for major semiconductor equipment makers, like Applied Materials, service and parts management is at a premium and a core feature in selling the main

products in the first place. For manufacturers of printers for both consumer and commercial uses, such as Hewlett-Packard and Xerox Corporation, there is often more revenue and profit in selling ink and after-sales services than in initial printer sales.¹⁵ For companies like these, the service business is an integral part of the corporate strategy. In addition, with continued consolidation through mergers and acquisitions, many companies are left with an unwieldy base of installed hardware and software that often needs to be serviced for decades. Doing this cost effectively, without losing customers and damaging brands, is a top service business challenge for many companies.

The Impact on Profitability and Growth

The service business typically is a more profitable operation than the primary product business. Our analysis suggests that the average profitability of service and parts operations (SPO) benchmarked is more than 75 percent higher than overall business unit profitability (Figure 3).¹⁶ The most profitable service businesses benchmarked—the top 25 percent—are more than three times as profitable as the average business unit.

In addition, the average annual growth rate of the service businesses benchmarked is about 10 percent higher than for the business units overall. The fastest-growing service parts operations—the top 25 percent—are growing at more than twice the rate of the average business unit.

On average, we estimate that 46 percent of total profits of the companies benchmarked are due to the service and parts businesses.¹

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, more than half of the service businesses benchmarked (55 percent) have profit levels lower than or on par with their business units. For more than two thirds (67 percent), their service businesses grow slower than or at the same rate as their overall businesses. The missed opportunities are significant.

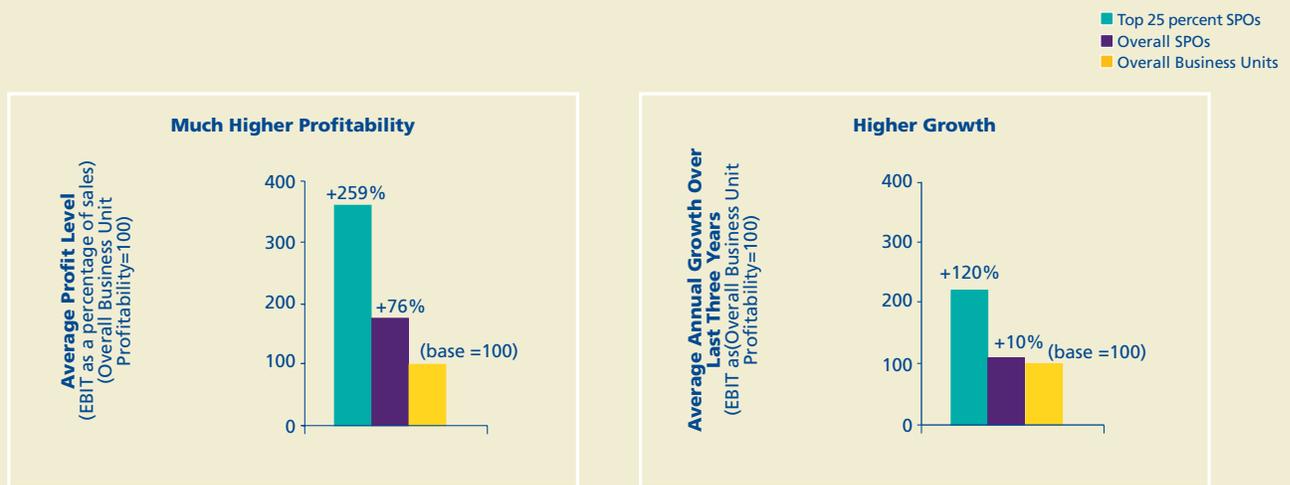
Figure 4: Potential for growth: Service and spare parts market share—select benchmark results

	Service market share (median in percent)		Spare Parts market share (median in percent)	
	Share of "captive" market*	Share of "total" market**	Share of "captive" market*	Share of "total" market**
Aerospace and defense	20%	5%	75%	75%
Automotive and commercial vehicles	0%***	0%***	70%	18.5%
Diversified manufacturing and industrial products	50%	20%	60%	22.5%
High technology and telecommunications equipment	40%	15%	90%	15%
Life sciences/medical devices	90%	10%	95%	35%
All companies	40%	10%	70%	25%

Note: Note: *The "captive" market share is defined as the share of the potential market for servicing a company's own installed base of products. **The "total market" is defined as the share of both the "captive" market as well as the "non-captive" market, which includes servicing competitors' installed base of products. *** For many automotive companies, independent dealers handle the "pure" service business, such as installation, maintenance and repair.

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

Figure 3: Profits and growth: The impact of the service and parts operation on business performance



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

Companies often fail to capture the market share potential for servicing their own installed base of products—the “captive” service market. The median benchmarked company’s captive market share is just 40 percent in “pure” services, such as field services, and about 75 percent in spare parts (Figure 4).

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 years or so. But as the vehicles age and the warranties expire, automakers’ captive market shares for parts typically drop—exactly when the need for parts and service increase. 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 and parts to customers who did not buy the original product (the “non-captive” market)—is typically 2 to 10 times larger than the captive markets. Our analysis shows that the service businesses of most companies today reach only a small share of this market, which suggests an even larger growth opportunity.

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—in turn building a global growth business and capturing a much larger share of the available market for those types of business services.¹⁸ From its inception in 1987, the success of Cat Logistics has been remarkable. 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. The client list is impressive with 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.”¹⁹

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. Indeed, some companies are showing that it is. Rolls-Royce’s services revenue increased by more than 60 percent over the last 5 years and has nearly tripled over the last decade—more than double the growth of the overall business. The business value is immense. As Sir John Rose,

chief executive officer of Rolls-Royce, has said: “Every time that Rolls-Royce sells an engine, we have significant opportunities to secure future revenues for services that will add value for our customer and add predictability to our own future earnings.”²⁰

Most companies, however, are late out of the gate. Not only do companies lose growth and profit opportunities, they jeopardize their business models. Inviting competitors to exploit captive markets for service and parts is a dangerous game. As manufacturers face increasing pressures from lower-cost competitors that may be able to provide products and service parts at significantly lower costs, the link to the final customers will become the ultimate battleground for competitiveness. If established manufacturers lose the service business battle, the field is wide open for emerging low-cost competitors to charge ahead. Losing that battle could very well mean losing the war.

In addition, major companies, in the automotive and other industries, are gradually outsourcing pieces of their core manufacturing operations, including parts production and assembly. 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 succeed.²¹

Furthermore, success in servicing 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, therefore, can be enormous.



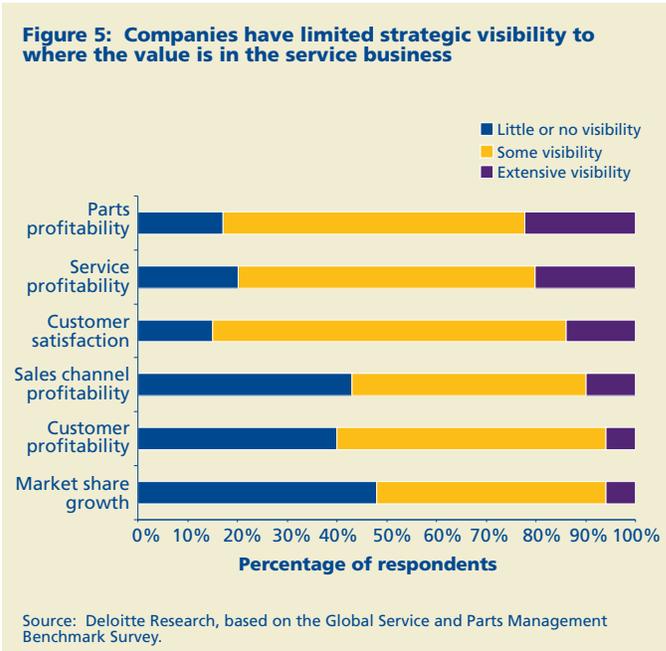
Building a Block-Buster Business Through Service Excellence: Challenges and Opportunities

Behind the persuasive statistics of the inherent growth and profit opportunities in service and parts management, however, a more uncomfortable reality is evident. Despite renewed efforts by companies to improve, our research suggests most companies are still treating the global service and parts business as an afterthought.²²

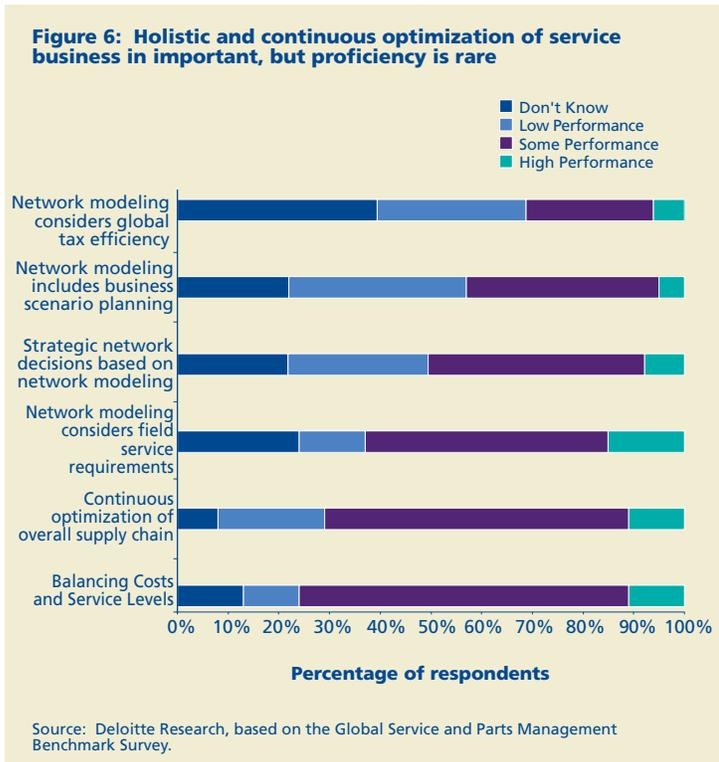
Strategy and Business Design: Laying the Foundation

At the most strategic level, senior executives often neglect to improve the service and parts business based on a lack of understanding of the potential. They often see the service business as a cost center or “cash cow” rather than as a very profitable growth business that can lead, rather than lag, enterprise growth.

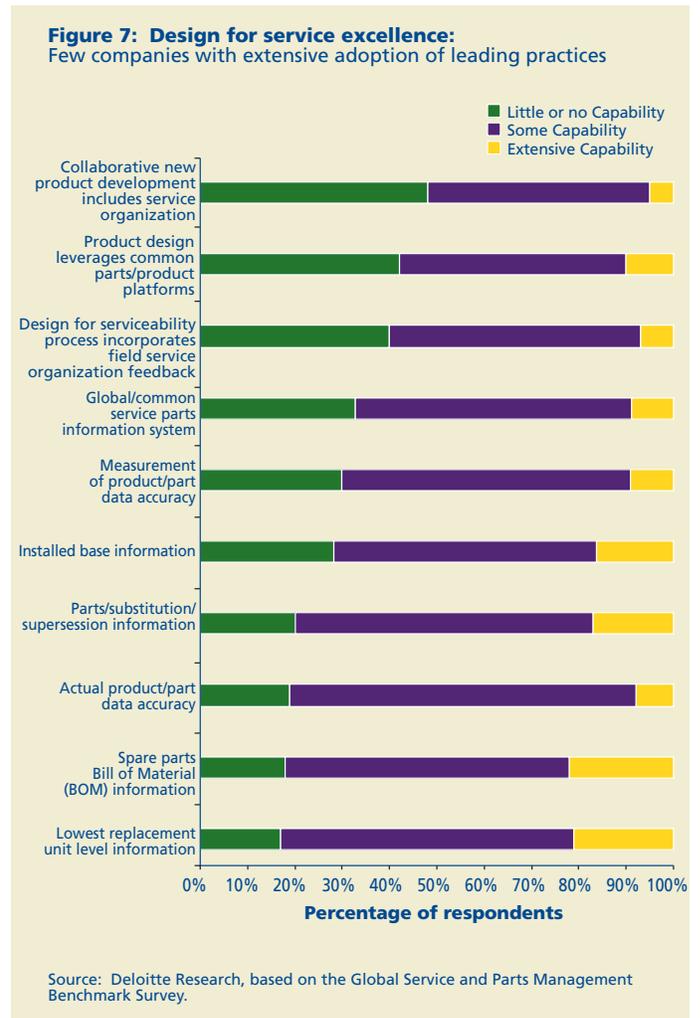
At the heart of the problem is a lack of insight into the real opportunity. For example, few of the companies benchmarked said they had extensive visibility into service profitability (20 percent), parts profitability (23 percent), sales channel profitability (10 percent), customer profitability (6 percent), and market share growth metrics (6 percent) (Figure 5). Without good visibility into the performance and potential of the service and parts business, executives are often left with a limited understanding of the business and unable to justify or prioritize major investments for improvement.



The ability to develop a strategy and an efficient design of the overall service business is a challenge for the majority of the companies benchmarked. While nearly 40 percent of 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, only one in 10 companies (11 percent) have high performance in this area today (Figure 6). Similarly, few respondents say they have achieved high performance in balancing cost and service level to customers (8 percent), and building scenario planning into network modeling (5 percent). Even worse, more than 30 percent of respondents say they are not doing well in building global tax efficiency into network modeling, and—rather unsettlingly—another 40 percent said they did not even know how they were doing in this area. Taking a holistic view of the business, including issues of tax and other regulatory and compliance issues, is of crucial importance to most complex companies struggling to get the value out of their global investments.²³



Building service excellence into the design of the business is difficult. Building it into the product design is perhaps even harder. But it is important. The cost and effectiveness of delivering customer service is typically heavily dependent on the design of the product being serviced. Yet only a few companies have effectively built service management into product innovation and lifecycle management decisions (Figure 7).

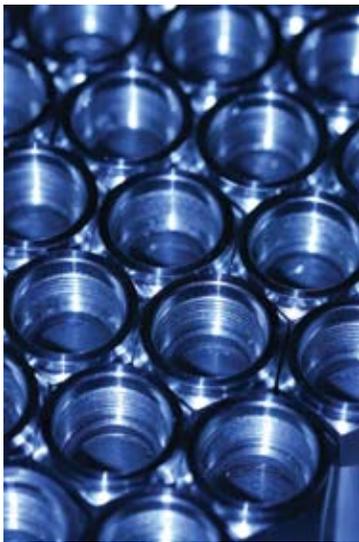


Another factor that frequently contributes to sub-optimal service businesses is ineffective organizational design, with a low level of investment in the people and competencies needed to drive top performance. Some companies invest up to 10 times more in their sales people than in their service staff. Given the strategic importance, profitability and growth potential of the service business relative to that 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.²⁴

For some companies, like Siemens Medical Solutions, a leader in providing imaging systems, therapy equipment, molecular diagnostics and hearing instruments, the service business is a strategic priority. Its customers increasingly expect to pay for equipment uptime—the time equipment is available for use by the customer. To achieve this, Siemens Medical Solutions is using state-of-the-art technologies, coupled with sophisticated processes and work flows, to deliver excellent customer service to its health care customers while controlling cost.²⁵ It is combining on-line, real-time repair information, inventory management, pricing, and invoicing with advanced logistics to equip service technicians with the right information and

parts at the right time and place. For example, the company is using simple “drop-off points” (DOPs) or “lock-boxes” to stage parts near customers, reducing the travel (or wasted) time for high-cost and highly valued service technicians. The lever for optimizing the efficiency of the field service engineers is combining the predictability of when a part will arrive at the drop-off point with the scheduled service job of the engineer at the client site. For Siemens, service capabilities like these have been critical in making the €8 billion Siemens Medical Solutions one of its most profitable business groups.²⁶

But the company realizes that the drive to maintain and enhance service excellence is an ongoing battle. For example, it expects many customers’ demands on response time to move from next-day service to same-day service in key markets around the world. This means that parts must be moved even closer to customers through one or more additional tiers of distribution centers, which will increase significantly the complexity of the service network. To reliably and cost-effectively meet customer requirements in a more complex network, information systems and business processes need to be strengthened further to ensure a precise global view of parts available to service specific customers within a short time frame.



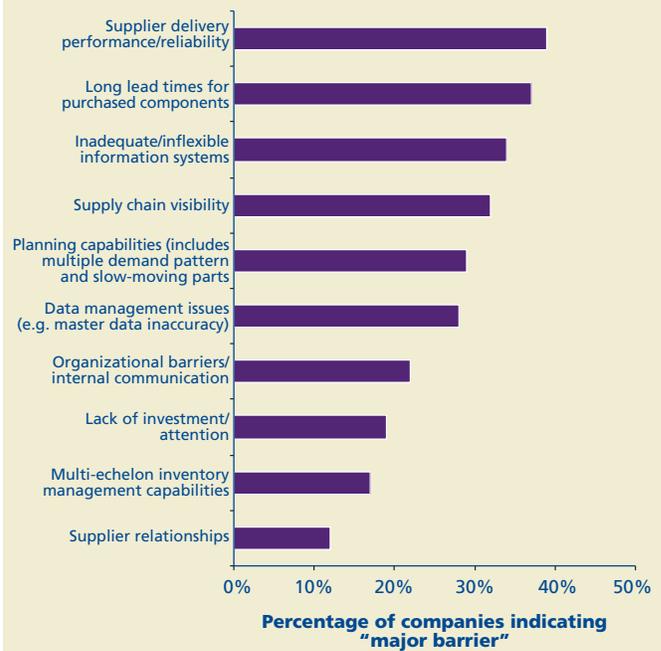
Operations Planning and Management: Enabling Service Excellence

A lack of capabilities for planning, managing, and monitoring the service business more effectively is holding back the performance of many of the companies we have studied.

Planning is a challenge. Among the companies responding, the median forecast accuracy for parts demand is less than 80 percent; for 25 percent of the companies it is lower than 52 percent. Even less encouraging: nearly 70 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.

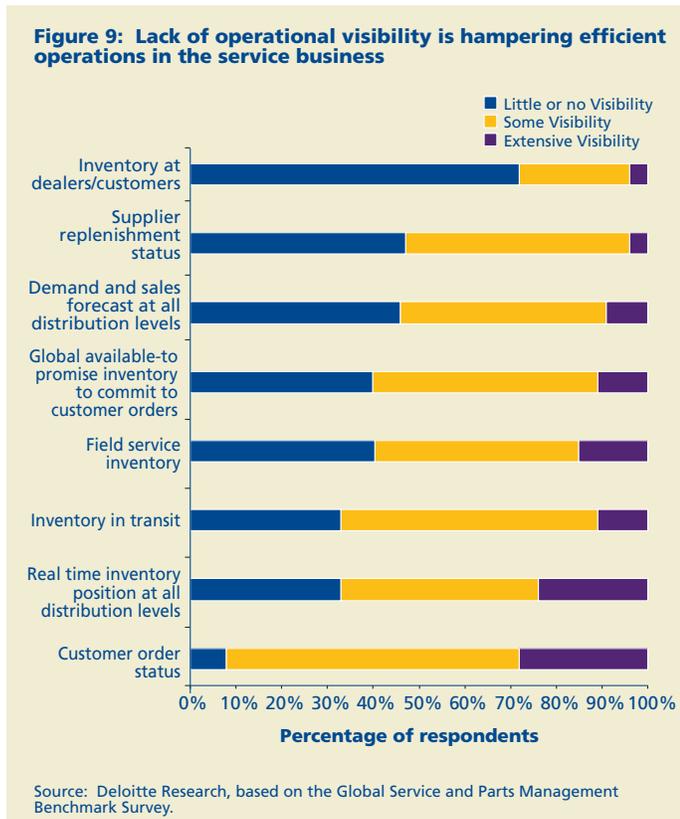
Many companies considered supplier responsiveness (49 percent) and long lead times (37 percent) major barriers to service excellence. With median on-time delivery rates from suppliers at a dismal 80 percent, this is understandable (Figure 8).

Figure 8: Top ten barriers to service excellence



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

It is no surprise that one third (34 percent) of the executives indicate that inadequate information systems are a major obstacle to service excellence. In addition, more than 30 percent indicated that supply chain visibility was a major obstacle. Executives at many companies said they had no or very limited visibility into key operational metrics, such as inventory at dealers/customers (72 percent); demand and sales forecast at all distribution levels (46 percent); and global available-to-promise inventory to commit to customer orders (40 percent). (See Figure 9)



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.²⁷ 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 this improved visibility, together 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 in excess of US\$460 million annually.²⁸

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 in 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.

Execution: Delivering Service Excellence One Customer at a Time

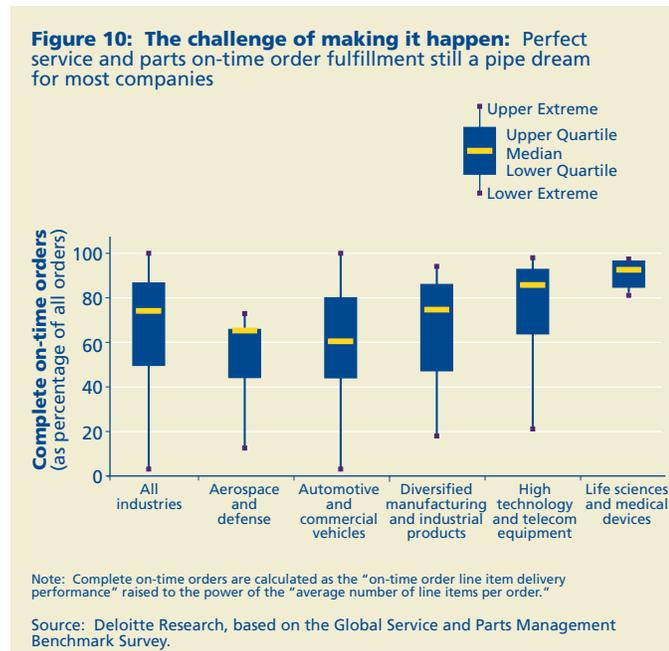
At the execution level, the “last mile to the customer,” companies typically lack the necessary capabilities to build profitable customer interactions that sustain customer satisfaction and loyalty. Getting the right parts and the right service to the right place at the right time is no small task. Doing this at the right level of overall cost and at the right price makes it even more challenging. Few companies master this.

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. High customer-facing inventory levels will not satisfy the customer if it is of the wrong kind and in the wrong place. The



median company benchmarked keeps inventories worth more than four months of sales in stock, but median on-time order-line item delivery to customer of only 93 percent. Because the median line items per customer order is 4 across the service businesses benchmarked, there is typically less than a 75 percent chance customers get exactly what they ordered on time.²⁹ This is a worrisome statistic on its own, and for many companies and in many industries the inventory turns and on-time delivery rates are much lower (Figure 10). Across the companies benchmarked, however, our findings do indicate that some companies are able to reach higher on-time delivery rates and higher inventory turns at the same time.



Service level agreements (SLAs) with customers are gaining ground across industries, including the aerospace and defense industry where the ability to sell through performance-based service and logistics contracts rapidly are becoming table stakes. However, many companies are running into significant challenges fulfilling them. Because they often have very limited access to critical customer data, they are unable to appropriately assess, quantify and manage contractual risks and typically lack an understanding of the critical capabilities they need to put in place to satisfy customers’ real needs at an affordable cost. Essentially, they are struggling to develop and manage a business model that they do not fully understand.

Not surprisingly, the median on-time customer response for SLAs is just 90 percent and, for many companies, far less. Given the high cost of equipment downtime in many industries, such as semiconductor manufacturing or mining, low service levels are a costly problem and unlikely to generate much in the way of customer loyalty.

Putting the processes and technologies in place for delivering service excellence—one “perfect” customer interaction at a time—is a significant challenge. Exacerbating the gap, 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 companies report exceptional performance on their goals for customer satisfaction (6 percent) and customer loyalty and retention (9 percent).

But there are some companies that take service execution to new heights. Twenty five percent of companies report that more than 95 percent of their service orders are resolved and closed on the first call. Likewise, a quarter of the service businesses benchmarked are able to deliver on time to customers more than 96 percent of the time. Doing this cost effectively is difficult at best, but some companies, like Hyundai Mobis, are building their businesses on a foundation of excellence in this area.

Hyundai Motor Company and Kia Motors Corporation are selling their passenger vehicles with warranties of up to 10 years/100,000 miles in key markets around the world. To do this cost effectively, 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’ 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.³⁰ The center is piloting the use of item-level radio-frequency identification (RFID) tagging coupled with a central computer system using 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.

According to Park Jeong-in, former CEO of Hyundai Mobis, the new facility will play a key role in the company’s global supply network: “With the Asan center, we will be able to provide improved service for our customers in the United States, China and other markets in the world, as well as those in South Korea.”³¹ 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.³²

Leapfrogging Through Process Collaboration and Technology Maturity

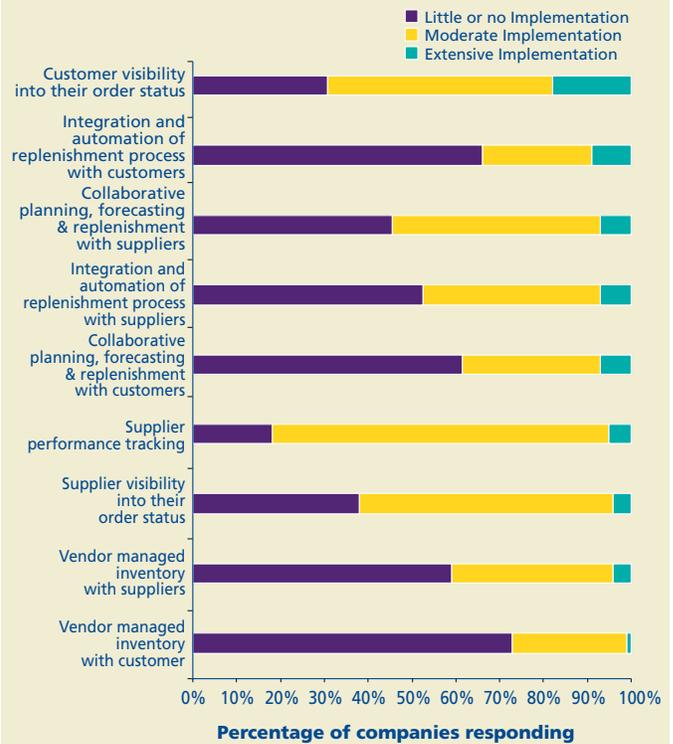
In reviewing the shortcomings of companies' efforts to drive the service business to new levels, two factors—process collaboration and technology—deserve special attention. Despite the possibility of adopting well-established processes and greatly enhanced and maturing technologies and tools to support the service business appropriately — from strategy and organizational design, to operations management and transactional execution—most companies have a long way to go.

In the area of process collaboration, a majority of companies benchmarked have significant work remaining on building the road for delivering service excellence. For example, only one in seven service businesses benchmarked (14 percent) provided customers with extensive visibility into their order status—a capability that can improve the customer experience and lower customer service costs (Figure 11). Similarly, just 7 percent have implemented extensive collaborative planning, forecasting and replenishment (CPFR) with customers and with suppliers. And while vendor-managed inventory (VMI) processes with customers often can take customer service levels to new heights by providing better visibility, reducing inventory levels and stock-out risks, as well as increasing customer order fulfillment rates, satisfaction, and loyalty, only 1 percent of the companies included in this study have undertaken extensive implementations. Nearly 70 percent of executives say they have no implementation of VMI or do not know the implementation status.

Despite their rudimentary level of implementation in many areas, the value of improved processes and collaboration with customers and suppliers is evident.³³ Our research suggests a strong correlation between the level of adoption of processes for collaboration and the benefits achieved (Figure 12).

As the experiences of some of the world's largest manufacturing companies show, the value of implementing tried and true processes and tools for service and parts management is hard to overstate. The Parts and Accessories division of Volkswagen AG, the US\$89 billion automobile manufacturer, experienced this first-hand in its North American operations.³⁴ With supplies coming from Europe and South America, more than 160,000 different parts, serving 1000 dealers with parts and accessories, 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, processes and planning techniques (including lean

Figure 11: Adoption of collaborative processes still has a long way to go in most service businesses

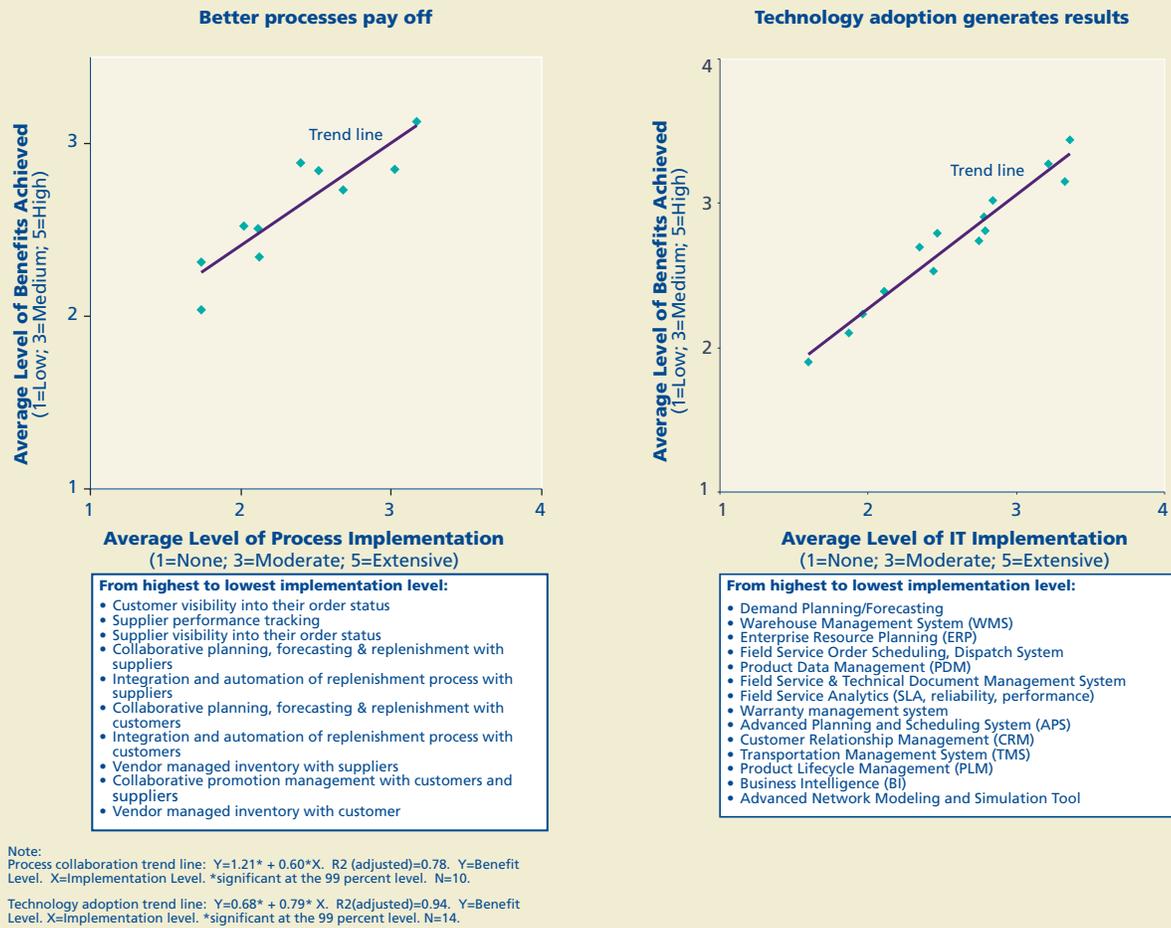


Source: Deloitte Research, based on the Global Service and Parts Management Benchmark Survey.

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 76 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 reaching more than US\$25 million per year, conservatively estimated.

In the technology area, many companies are neglecting to upgrade their infrastructure to enable differentiating performance in the service business. In fact, executives asked to list the top barriers to operational excellence in their service business frequently cited inadequate and inflexible information systems. (See Figure 8 on page 9.) 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.³⁵ While enterprise resource planning (ERP) software, warehouse management systems (WMS), and demand planning and forecasting software tools have achieved extensive adoption in up to 30 percent of the companies studied, many other tools and

Figure 12: Better processes and information technology matters to service excellence
 Level of implementation correlated with level of benefits achieved



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

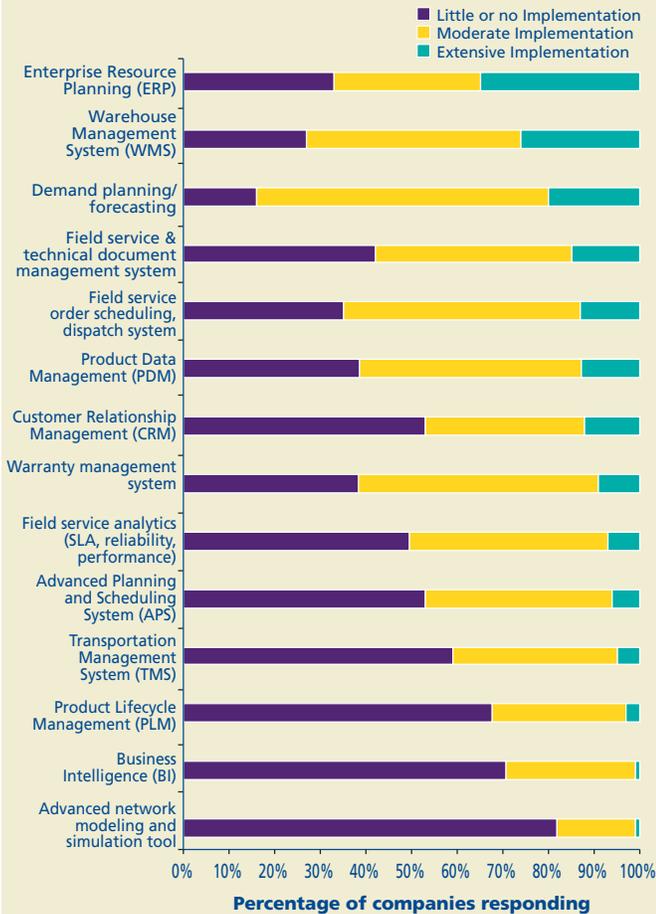
technologies have yet to gain acceptance (Figure 13). Few service operations have extensive implementations of systems for customer relationship management (11 percent), product data management (10 percent), and advanced planning and scheduling (6 percent).

Yet, technologies and systems for designing, managing, and optimizing service and parts operations—such as advanced planning and scheduling, field service management tools, and customer relationship management systems—have improved dramatically over the last decade. They are no longer the obstacle to transforming the service and parts operations they may have been 5, 10, or 20 years ago. Indeed, as experiences across a range of industries show, the benefits that can be realized from adoption of new technologies and systems for

managing and optimizing the service business are substantial. Our analysis shows a strong correlation between information system adoption and the benefits achieved. (See Figure 12 above.)

The adoption of radio-frequency identification (RFID) and related technologies for real-time sensing and communication is still only nascent in most of the companies benchmarked. Barriers to adoption of RFID mentioned by executives include issues relating to the costs and benefits of adoption, technology maturity, and systems integration and industry communication standards (Figure 14). Interestingly, few companies saw significant problems around information sharing with suppliers and customers around their service business, indicating a potential for taking a collaborative approach to adoption of these technologies.

Figure 13: Technology adoption in service business lagging



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

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 help support integrated product and service strategies. For some companies, these technologies provide much needed capabilities for enhancing customer service levels while maintaining or even reducing the cost of delivery. General Electric, the US\$152 billion diversified technology, media and financial services company, is applying RFID to manage and optimize equipment installation and use. It is using RFID technologies to tag large-scale power-generation equipment parts and modules for easier identification and assembly at customer sites.³⁶ In 1995, General Motors created OnStar to provide customers in-vehicle safety, security, and information services called “telematics,” serving nearly 4 million customers by the end of 2005. The OnStar Vehicle Diagnostics system provides customers with both instant and periodic diagnostic checks of key areas—such

Figure 14: Barriers to implementing RFID in the service and parts business

Rank	Barrier
1	Cost of implementing RFID
2	Internal perception of cost/benefit
3	RFID technology maturity
4	System integration issues
5	Industry communications standards for RFID
6	Supplier perception of cost/benefit
7	Data synchronization
8	Cost and benefit sharing between supply chain partners
9	Lack of internal capabilities/training in RFID implementation skills
10	Customer capability
11	Internal business processes
12	Supplier capability
13	Customer perception of cost/benefit
14	Information sharing policies with suppliers
15	Information sharing policies with customers

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

as engine and transmission, brake system, and air bags—and will send status reports to customer via e-mail so they can schedule any needed service visits.³⁷

Rolls-Royce uses state-of-the-art sensing and communication technology to provide exemplary customer service.³⁸ In one example a Rolls-Royce jet engine on a passenger airplane in flight over the Pacific was hit by lightning. While the engine shut down and restarted appropriately, this kind of incident normally would require an unscheduled maintenance inspection on landing in Los Angeles, which would cost both time and money due to a significant delay. Because Rolls-Royce sensor and communications systems could access the data feed from the engine monitors in flight, Rolls-Royce was able to temporarily build in a variance to the maintenance program and schedule the maintenance at a more suitable time. With its strong capabilities for real-time service, Rolls-Royce handled the incident with flying colors and estimates the savings for the airline customer from this event alone were US\$1 million or more. As the A&D industry moves towards performance based services, a US\$1 million event like this could become an un-billable cost under a service level agreement (SLA) contract. The ability to increase customer service levels at lower cost by reducing the number of unscheduled engine removals is rapidly becoming a core capability for survival and success in the industry.

Why Now? Chasing the Changing Basis of Competition in Manufacturing

There are a number of critical reasons why top executives need to prioritize the service business among their strategic initiatives and investments

First, the business model of many global manufacturers is under attack due to changing customer and consumer demands, maturing home markets, and competition from low-cost manufacturers. This is taking its 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 low-cost country sourcing. 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 for newcomers to copy. In emerging markets, such as China and India, service and parts operations are under attack by price competition, and counterfeit and will-fit (and sometimes “ill-fit”) parts, in turn jeopardizing 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 lifecycles for main products make service excellence even more important. The combination of short sales cycles due to product proliferation and long service life cycles is a recipe for escalating costs, parts obsolescence, lost customer focus, and deteriorating customer service quality, if not properly managed. Among the benchmarked service operations, the median inventory obsolescence rate stood at 5 percent and in many cases exceeded 10 percent or more—a costly symptom of service business problems.³⁹

Third, quality issues and problems with service and parts can exact a staggering toll in terms of both warranty costs and brand damage. No wonder, then, that analysts estimate industrial equipment makers will invest a total of US\$1 billion over the next five years to overhaul warranty management and spare parts logistics.

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 sales increase.⁴⁰

And, finally, the increasing complexity of the business—e.g., through business expansion into new markets, mergers and acquisitions, continued outsourcing of parts production, logistics, and service delivery, more and more new products, shorter initial product sales cycles but long service-cycles combined with more complex demands from customers for comprehensive service-based contracts—will make the business challenges and risks even more daunting.⁴¹ Customers are likely to demand better tailored and better managed service solutions, often combined with risk-sharing agreements, from their suppliers. Ensuring the right customer experience—the right product, the right service, the right branding, the right price, all delivered to the right place at the right time—will become even more difficult in the years ahead. But for those able to manage the complexity, the cost and the risks, the results can be remarkable.

Conclusion

With significantly higher profitability and a growth potential that is still under-exploited in a majority of the companies benchmarked, the service and parts business is the overlooked jewel of many corporate portfolios, rarely receiving the attention it deserves. Joining the service revolution in manufacturing industries may be one of the most fundamental steps companies can take to ensure their future survival and success.

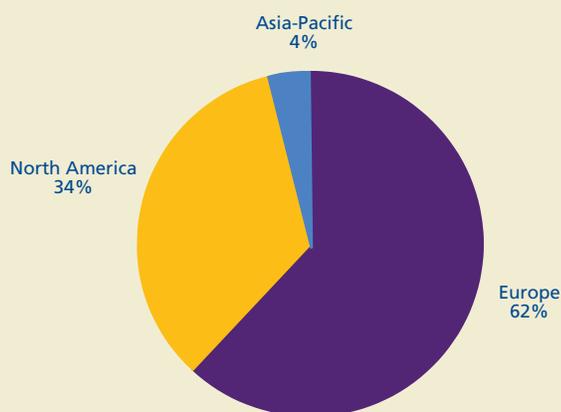


Appendix: Survey Methodology and Respondent Profile

This study is based in part on our ongoing Global Service and Parts Benchmark Survey, encompassing nearly 80 companies and business units to date across Europe (62 percent), North America (34 percent), and Asia-Pacific (4 percent) (Figure A).

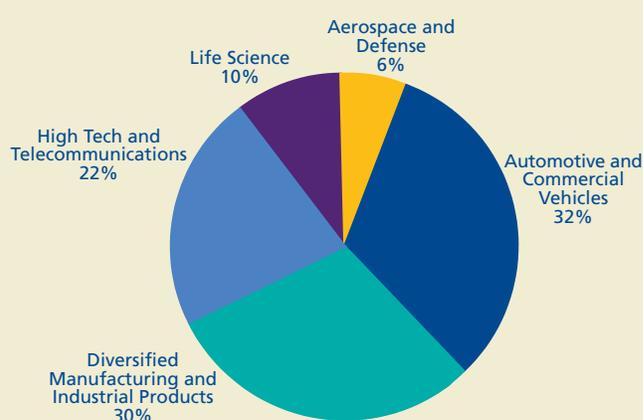
Companies from a wide range of industries have participated, including aerospace and defense (6 percent), automotive and commercial vehicles (32 percent), diversified manufacturing and industrial products (30 percent), high technology and telecommunications (21 percent), and life sciences (10 percent) (Figure B).

Figure A: Profile of corporate headquarters by region



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

Figure B: Industry profile

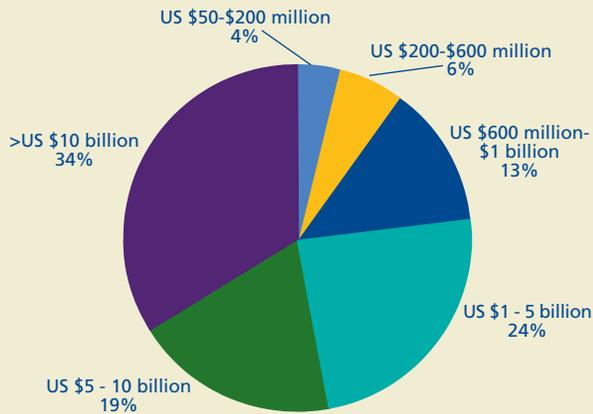


Source: Deloitte Research, based on the Global Service and Parts Management Benchmark Survey.

Of all reporting companies, 77 percent have corporate revenues larger than US\$1 billion, and 23 percent have revenues ranging US\$50 million to US\$1 billion (Figure C).

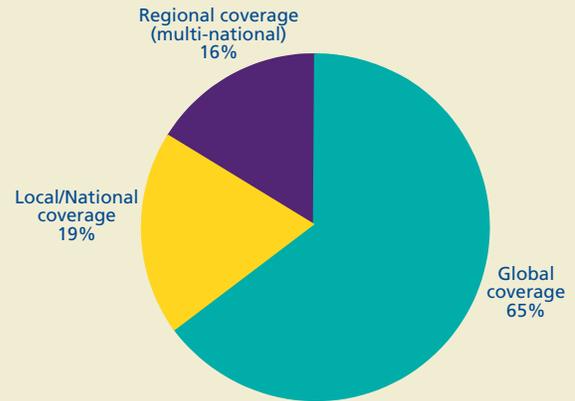
Nearly two-thirds (65 percent) of the service and parts businesses benchmarked have global coverage and another 17 percent have regional (multi-national) coverage. The remaining 19 percent focus on national or local markets (Figure D.)

Figure C: Corporate revenue profile



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

Figure D: Service and parts business profile



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

End Notes

- 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 For more on the global trends in manufacturing, innovation, and supply chain management, see e.g. Deloitte Research, *Mastering Complexity in Global Manufacturing: Powering Profits and Growth through Value Chain Synchronization* (New York and London: 2003); Deloitte Research, *Mastering Innovation: Exploiting Ideas for Profitable Growth* (New York: 2004); and Deloitte Research, *Unlocking the Value of Globalization: Profiting through Continuous Optimization* (New York and London: 2005).
- ³ 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.
- ⁴ Profitability is measured as earnings before interest and taxes (EBIT) as a percentage of sales revenue.
- ⁵ See Michael Schmidt and Steve Aschkenase, “The building blocks of service excellence,” *Supply Chain Management Review*, July/August 2004.
- ⁶ Source: Rolls-Royce, www.rolls-royce.com.
- ⁷ For Xerox, service revenue share is calculated as the share of “post-sale and other revenue” in total revenues. “Post-sale and other revenue” includes service, outsourcing and rentals, supplies, paper and, other sales. See *Xerox Annual Report 2004*.
- ⁸ See also Rolls-Royce, http://www.rolls-royce.com/civil_aerospace/overview/default.jsp; and Deloitte Research, *Making Customer Loyalty Real: Lessons from Leading Manufacturers* (New York, 1999). For more on the after-sales service business in the commercial airline market, see also Mark Dixon Büniger and Henry H. Hartevelde, “Overhauling Airline Maintenance,” *Forrester*, October 13, 2004.
- ⁹ See *Defence Acquisition University*; <http://www.acc.dau.mil.com>.
- ¹⁰ See Ian Rowley, “Lexus to the rescue: Losing luster in the luxury market at home, Toyota is rolling out the marquee to fight European imports,” *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.
- ¹¹ Apple shipped 6,451,000 iPods during its fourth quarter ended September 24, 2005. See “Apple reports fourth quarter results: Apple concludes best quarter & best year in company history,” October 11, 2005. See www.apple.com. See also Paul Taylor, “Demand for iPod and Nano help Apple quadruple profits,” *Financial Times*, October 12, 2005.
- ¹² See “The resurrection of Steve Jobs - Face value,” *The Economist*, September 17, 2005.
- ¹³ See “Letter to stakeholders,” *General Electric Annual Report 2004*.
- ¹⁴ See e.g. *ABB Services Executive Review 2005*. See also www.abb.com.
- ¹⁵ See Ken Spencer Brown, “New marketing tack,” *Investor’s Business Daily*, August 12, 2005.
- ¹⁶ 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.
- ¹⁷ Other analysis suggests that “... aftermarket service and parts account for 20% to 30% of revenues and about 40% of profits for most manufacturers,” according to Tim A. Minahan, “Service parts management: Unlocking value and profits in the service chain,” Aberdeen Group, 2003.
- ¹⁸ See Michael Schmidt and Steve Aschkenase, “The building blocks of service excellence,” *Supply Chain Management Review*, July/August 2004.
- ¹⁹ See *Caterpillar 2004 Annual Report*.
- ²⁰ See *Rolls-Royce Annual Report 2004*.

- ²¹ See e.g. “Extinction of the predator—The global car industry,” *The Economist*, September 10, 2005.
- ²² See Deloitte Consulting, *Aftermarket, Afterthought: Getting More Value from Your Service Parts Supply Chain* (New York, 2003).
- ²³ See Deloitte Research, *Unlocking the Value of Globalization: Profiting from Continuous Optimization* (New York, 2005).
- ²⁴ See also Deloitte Research, *It’s 2008: Do You Know Where Your Talent Is?* (New York: 2005).
- ²⁵ See presentation by Frank Ellsner, Siemens AG Medical Solutions, “Uptime Services: Siemens Medical Solutions,” *Service Parts Management with SAP*, Berlin, 28-29 September, 2005.
- ²⁶ See *Siemens Annual Report 2005*. See also Jack Ewing and Diane Brady, “Siemens’ New Boss,” *BusinessWeek*, January 24, 2005.
- ²⁷ See Michael Schmidt and Steve Aschkenase, “The building blocks of service excellence,” *Supply Chain Management Review*, July/August 2004.
- ²⁸ See Michael Schmidt and Steve Aschkenase, “The building blocks of service excellence,” *Supply Chain Management Review*, July/August 2004.
- ²⁹ Calculated based on a 93 percent on-time fill-rate per order line. Given that there are typically 4 line items per order, the complete on-time order fill rate is less than 75 percent (or 0.93 raised to the power of 4 and expressed as a percentage).
- ³⁰ See e.g. “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. See www.mobis.co.kr.
- ³¹ 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. See www.mobis.co.kr.
- ³² Estimate. See *Hyundai Mobis Annual Report 2004*.
- ³³ Indeed, the value of better processes for managing the service and parts business is well understood. See e.g. Deloitte Consulting, *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.
- ³⁴ See *Volkswagen AG Annual Report 2004*.
- ³⁵ Research indicates that spending on service and parts management IT is 60 percent below main line business and that automation of service lifecycle management is important. According to one study focused primarily on North American companies, the 65 percent of businesses that have not automated to support service life-cycle management (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.
- ³⁶ Presentation by Joseph Salvo, Pervasive Decision Systems Laboratory, Information & Decision Technologies, General Electric Company, at the Massachusetts Institute of Technology Forum for Supply Chain Innovation, June 15, 2004.
- ³⁷ See P. Koudal, H. L. Lee, B. Peleg, P. Rajiwat, and S. Whang, “OnStar: Connecting to Customers through Telematics,” *Stanford Graduate School of Business Case GS-38*, October 2004. See also www.gm.com.
- ³⁸ Source: Miles Cowdry, Director—Services, Rolls-Royce plc, at *SAPPHIRE Europe*, Copenhagen, Denmark, April, 2005. For more on Rolls-Royce’ customer service capabilities, see also Stanley Reed, Diane Brady, and Bruce Einhorn, “Rolls-Royce at your service: Careful attention to customers is key to its rebound in commercial jet engines,” *BusinessWeek*, November 14, 2005.
- ³⁹ The inventory obsolescence rate is defined as the percentage of inventory classified as obsolete (non-sellable or out-of-date) on an annual basis.
- ⁴⁰ See *Hyundai Mobis Annual Report*, 2004.
- ⁴¹ On the current and future complexity trends, see e.g. 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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