

Warranty Management

The Bridge to Future Revenue Creation

May 2010

Bill Pollock

Executive Summary

The ability to provide customers with warranty-based services and support is only a small part of warranty management. There must also be the ability to use effective warranty management to improve time- and quality-related performance, as well as to contain costs and create new and / or enhanced service revenue streams. In a survey of 115 respondents conducted in March 2010, Aberdeen found that Best-in-Class service organizations are leading the industry – and preserving their Best-in-Class status – by utilizing warranty analytics to support key processes, regularly and systematically measuring performance, and empowering / incentivizing employees to foster improved performance and a stronger bottom line.

Research Benchmark

Aberdeen's Research Benchmarks provide an in-depth and comprehensive look into process, procedure, methodologies, and technologies with best practice identification and actionable recommendations

Best-in-Class Performance

Aberdeen used the following three key performance criteria to distinguish Best-in-Class companies:

- 2.0 days warranty claim processing time
- 30% decrease in length of time to process a warranty claim
- 19% decrease in warranty-related repair / return costs

Competitive Maturity Assessment

Survey results show that the firms enjoying Best-in-Class performance are:

- 2.5 times more likely than Laggard firms to have a closed-loop warranty management system in place
- 1.3 times more likely than Laggard firms to have warranty reporting software in place
- 58% more likely than Laggard firms to have a warranty claim processing system in place

“Warranty management is the key to bottom line profits.”

- Ken Staubitz,
Director of Service, Modern
Office Methods

Required Actions

In addition to the specific recommendations in Chapter Three of this report, to achieve Best-in-Class performance, companies must:

- Establish an end-to-end workflow process to manage warranty claim and product return operations
- Integrate warranty management more fully with service execution
- Close the warranty loop by introducing more warranty analytics automation into the system
- Create a centralized data warehouse for product performance and warranty information
- Use warranty-specific metrics to regularly monitor and track warranty management performance

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Chapter One: Benchmarking the Best-in-Class

Business Context

According to data originally reported in Aberdeen's May 2008 *Forging the Warranty Chain* benchmark report, a majority of service executives found themselves wrestling with escalating warranty costs (58%) and post-sale customer satisfaction issues (57%) in their efforts to drive warranty chain improvement initiatives within their respective service organizations. As a result, many took steps to implement a closed-loop analytic-driven warranty chain, revise existing business processes and adopt new technology solutions to better manage warranty workflow, enhance claims administration, reduce costs, create revenues, and improve customer satisfaction. The report also revealed that by doing so, leading firms were able to reduce their total warranty claim processing times from 5.2 days to 2.7 days, thereby accomplishing the joint goals of reducing costs and improving customer satisfaction.

The Aberdeen research cited also reported that 70% of leading firms currently had an integrated warranty and service management organization in place, 70% had a vice president or higher executive overseeing both the service and warranty functions, and 69% were using automated warranty claim processing systems to realize their warranty management performance goals. In addition, 83% of executives polled believed that warranty chain performance was important to their companies' success with more than half (56%) claiming it was more important at that time than two years previous, primarily on the basis of the need for improved speed and cost containment.

The findings of the 2008 study concluded that leading service organizations had already begun to realize the critical impact of effective warranty management on their company's bottom line performance through the leveraging of technology and the application of effective business processes and workflows. As a result, these organizations were able to take steps to streamline their warranty management processes, lower overhead and processing costs, and reduce the number of product failure incidents by implementing the analytics necessary to link warranty and product design into a closed loop system.

This updated 2010 study examines how these and other emerging best practices empower today's leading firms to attain high levels of warranty management performance while reducing overall costs, improving customer satisfaction, and creating new service revenue streams.

Market Pressures Driving Warranty Management

The two greatest warranty-related market pressures facing service organizations today are post-sale customer satisfaction issues (53%) and escalating warranty-related costs (48%), as shown in Figure 1. However,

Warranty Management - A Global Definition

The broad definition of warranty management may include any of the following components:

- √ Warranty creation / structure / pricing
- √ Warranty sales
- √ Warranty administration
- √ Asset recovery
- √ Claims management
- √ Supplier recovery
- √ Customer management

Fast Facts

- √ Best-in-Class organizations are 62% more likely than Industry Average firms to have an end-to-end workflow process in place to handle warranty claims
- √ Best-in-Class organizations are 48% more likely than Industry Average firms to conduct regular, systematic measurement of claim rates
- √ Best-in-Class organizations are 47% more likely than Industry Average firms to have a centralized data warehouse for warranty-related data / information

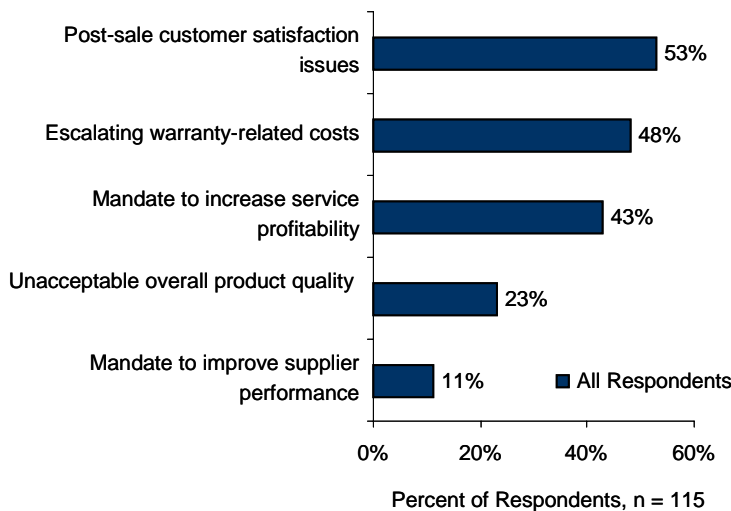
while these represent the same top two pressures cited in the 2008 study, they appear in reverse order in 2010. This reversal of rank order confirms that over the previous two years, while post-sale customer satisfaction pressures have remained at the forefront of concern for a majority of service organizations, there has nonetheless been a modicum of success resulting from the carrying out of cost containment initiatives targeted at keeping escalating warranty costs under a relative measure of control.

However, the principal shift in the impact of market pressures on warranty management is manifested with respect to the mandate to increase service profitability, cited by 43% of respondents in 2010, compared to 29% in 2008 – an increase of almost one-half (48%) in only two years. Therefore, whereas the primary focus of warranty management initiatives in the past had centered on cost containment and customer satisfaction enhancement, this finding, in particular, signifies the rise in impact of bottom-line-related issues in today's volatile service economic environment.

“We have been looking for ways to better manage our costs. Our previous systems limited our ability to get the details required to perform the necessary analysis.”

~ Director, Operations, Mid-Size North American Medical Device Company

Figure 1: Market Pressures Driving Warranty Management



Source: Aberdeen Group, May 2010

These shifts in market pressures have also led to new challenges for many service organizations that now find themselves wrestling with a mixed bag of warranty-related issues (Figure 2). For example, nearly a quarter (23%) of Best-in-Class firms cite reverse logistics management as having represented a top challenge over the previous two years – more than twice as many as either Industry Average or Laggard firms. The main reason for this gap is that leading firms have recognized that effective reverse logistics management can result in both reduced costs and improved profit margins – plus, they most likely already have the expertise and resources to execute on it (see Aberdeen Group's [Reverse Logistics: Driving Improved Returns Directly to the Bottom Line](#) report published in February 2010).

KPI Values that Distinguish Best-in-Class Status

The three KPI values that distinguish Best-in-Class status are:

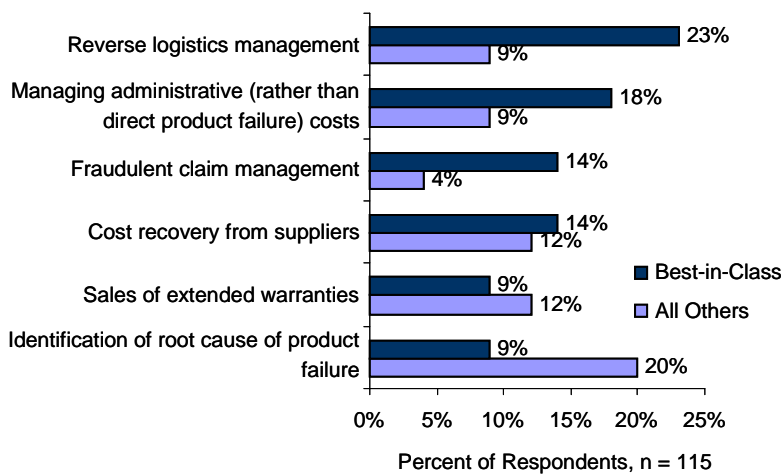
- √ 2.0 days warranty claim processing time
- √ 30% decrease in length of time to process a warranty claim
- √ 19% decrease in warranty-related repair / return costs

Two other areas reflect similar patterns, where Best-in-Class firms cite twice the challenge as compared to all other organizations; namely, managing administrative costs associated with warranty fulfillment and fraudulent claim management. For each of these two specific challenges, leading firms recognize that effective warranty management will also lead to reduced costs and a resultant improved bottom line, whereas other firms may not have either the tools or resources to effect either performance improvement or cost savings.

“The main reason it is so important to invest in a warranty management solution at this time is because fierce competition forces our industry to constantly improve the cost situation.”

~ Uwe Feil, General Manager
Technical Service & Support –
Toshiba Europe Computer
Systems

Figure 2: Most Significant Warranty Management-Related Challenges over the Past Two Years



Source: Aberdeen Group, May 2010

“It is so important to invest in a warranty management solution for our service organization at this time in order to improve product quality, fraudulent claims, and improved warranty recovery from suppliers.”

~ Director Logistics / Supply
Chain - Large North American
Computer Equipment
Company

The Maturity Class Framework

Aberdeen used three key performance criteria to distinguish the Best-in-Class from Industry Average and Laggard organizations (Table 1). While all three classes reflected year-over-year decreases in length of time to process a warranty claim, and warranty-related repair / return costs, Best-in-Class firms clearly outshone all others in each of these critical performance measurement criteria, as well as for number of days warranty claim processing time.

Table 1: Top Performers Earn Best-in-Class Status

Definition of Maturity Class	Mean Class Performance
Best-in-Class: Top 20% of aggregate performance scorers	<ul style="list-style-type: none"> ▪ 2.0 days warranty claim processing time ▪ 30% <u>decrease</u> in length of time to process a warranty claim ▪ 19% <u>decrease</u> in warranty-related repair / return costs

Definition of Maturity Class	Mean Class Performance
Industry Average: Middle 50% of aggregate performance scorers	<ul style="list-style-type: none"> ▪ 4.3 days warranty claim processing time ▪ 6% <u>decrease</u> in length of time to process a warranty claim ▪ 1% <u>decrease</u> in warranty-related repair / return costs
Laggard: Bottom 30% of aggregate performance scorers	<ul style="list-style-type: none"> ▪ 15.4 days warranty claim processing time ▪ 4% <u>increase</u> in length of time to process a warranty claim ▪ 9% <u>increase</u> in warranty-related repair / return costs

Source: Aberdeen Group, May 2010

The effectiveness of warranty management is largely dependent on the organization's capabilities and performance relating to time and cost factors. While each category of factors is important in and of itself, both, together, ultimately impact customer satisfaction and retention, in addition to the bottom line. Therefore, it is not surprising that those firms attaining Best-in-Class status also attain the highest levels of performance for these factors.

Overall, and across multiple industry segments, Best-in-Class firms reflect the shortest average warranty processing times as measured in days. In fact, leading firms are able to process their warranty claims in less than half the time of Industry Average firms, and one-seventh the time of Laggard organizations. While the average warranty claim processing times vary significantly from one vertical segment to another, the mean averages reported for each of the three Aberdeen Maturity Class segments is still reflective of the relative differences between and among the classes.

However, the main distinguishing factors that separate Best-in-Class firms from all others are best reflected in the areas of year-over-year changes in the length of time to process a warranty claim, and warranty-related repair / return. While Best-in-Class and Industry Average firms have both experienced year-over-year decreases in the former category, Best-in-Class firms clearly outpace the field in terms of magnitude (i.e., 19% decrease for Best-in-Class, compared with only a 6% decrease for Industry Average, and a 4% increase for Laggards). This is an important distinction as it identifies the specific areas where Best-in-Class firms gain their advantage over all others with respect to their ability to convert quicker processing times into reduced costs, improved customer satisfaction and, ultimately, into increased service revenues and a stronger bottom line.

However, for year-over-year change in warranty-related repair / return costs, the difference among Maturity Classes is even more pronounced, with Best-in-Class firms realizing a 19% decrease, compared with a virtual flat-lining among Industry Average firms (i.e., only a 1% decrease) and a 9% increase for Laggards. As such, not only are the differences between and among the three classes significant, but the relative differences are certain to

inhibit Industry Average firms from gaining significant ground against Best-in-Class firms, and Laggard firms are positioned to lose ground against all other classes. Thus, the variances between and among the three classes is likely to be maintained over time.

The Best-in-Class PACE Model

Aberdeen's proprietary Best-in-Class PACE model is built on a framework designed to highlight and compare the key strategies and capabilities employed by firms that attain Best-in-Class status. This status is gained through their excellence in facing the market pressures head-on, taking the appropriate actions in dealing with these pressures, utilizing their existing capabilities, and leveraging the appropriate mix of enablers (i.e., technologies, partners, etc.) to attain their target goals and objectives. As such, the PACE model serves as a roadmap for all others (i.e., Industry Average and Laggards) to replicate the strategies employed – and the capabilities developed, enabled and executed – by Best-in-Class firms in order to improve their performance along the lines of the key performance indicators and metrics.

Table 2: The Best-in-Class PACE Framework

Pressures	Actions	Capabilities	Enablers
<ul style="list-style-type: none"> ▪ Post-sale customer satisfaction issues 	<ul style="list-style-type: none"> ▪ Institute or enforce process workflow to recover more costs from suppliers ▪ Install processes to provide “early warning” of potential large-scale or systematic product failures 	<ul style="list-style-type: none"> ▪ End-to-end workflow process in place to handle warranty claim and product return operation ▪ Regular, systematic measurement of warranty costs ▪ Regular, systematic measurement of claim processing time ▪ Warranty management organization is structured to integrate with all service functions ▪ Senior executive (VP or higher) has oversight of all warranty management 	<ul style="list-style-type: none"> ▪ General enablers <ul style="list-style-type: none"> - ERP system - Service Management System (SMS) - CRM system - Depot repair management system - Spreadsheets ▪ Warranty-specific enablers <ul style="list-style-type: none"> - Warranty claims processing system - Warranty reporting software - Warranty analytics software

Source: Aberdeen Group, May 2010

Best-in-Class Strategies

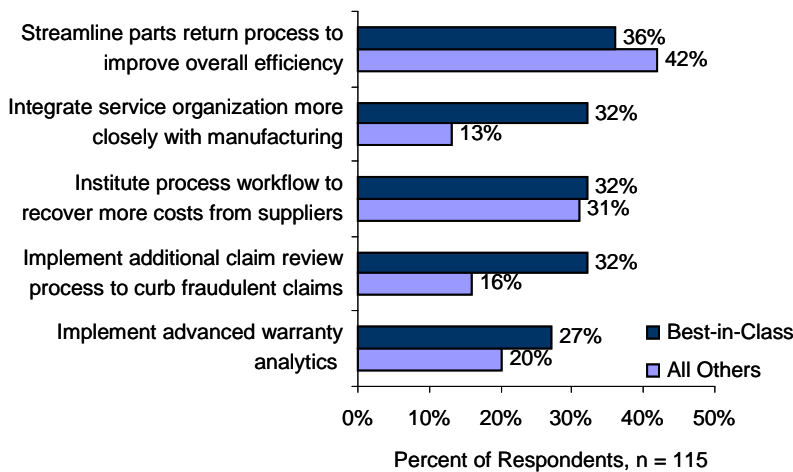
A third or more of Best-in-Class firms focus on four key strategic areas with respect to warranty management centering primarily on process and integration, while all others focus more heavily on process (Figure 3). While all classes of service organizations are currently undertaking similar strategic actions relating to the streamlining of the parts return process to improve

overall efficiency, the greatest differences among the classes come in the areas of:

- Integrating the service organization more closely with manufacturing
- Implementing additional claim review processes to curb fraudulent claims
- Implementing advanced warranty analytics

The reason these actions are relevant is that they provide Best-in-Class firms with the means to integrate their respective warranty management activities among principal organizational departments (i.e., service, manufacturing, others), and implement the additional claim review processes and advanced warranty analytics that may be used to streamline the overall parts return process. Ultimately, this will also likely result in the reduction / containment of overall warranty processing costs, while fostering enhanced customer satisfaction, and driving additional service revenue streams.

Figure 3: Strategic Actions of the Best-in-Class



“Over the next 12 to 24 months we are looking at warranty entitlement tools, remote diagnostics tools, and CE mobile tools in regard to enhancing our warranty chain capabilities.”

~ Director Logistics / Supply Chain - Large North American Computer Equipment Company

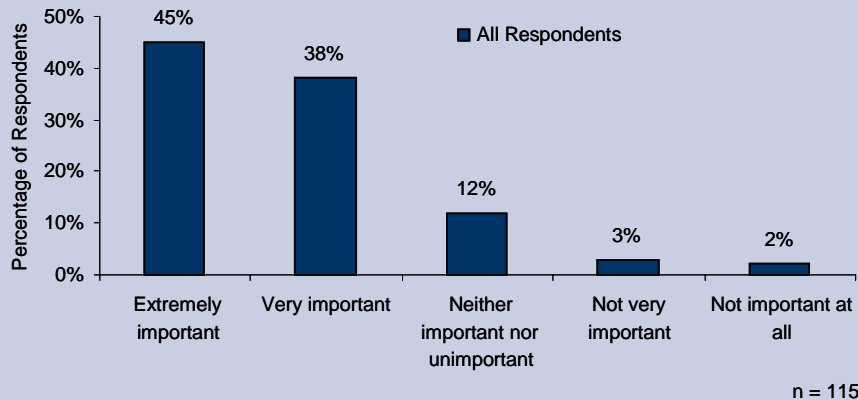
Source: Aberdeen Group, May 2010

Overall, through these findings, the data reveal how Best-in-Class firms are able to achieve quicker warranty claim processing times, and higher levels of year-over-year decreases in length of time to process a warranty claim and warranty-related repair / return costs than their Industry Average and Laggard counterparts.

Aberdeen Insights — Importance of Warranty Management vs. Satisfaction with the Company's Current Approach

Presently, 83% of respondent service organizations believe warranty management to be important to the company's overall performance – in fact, 83% cite it as "very important" or higher (95% for Best-in-Class firms), as shown in Figure 4. This percent response is further supported by 54% of respondents indicating warranty management is more important today than one year ago, compared with only 2% believing it to be less important. Thus, it is not necessarily the belief that warranty management is important that may be holding back some organizations, but, rather, their ability to plan, implement and execute.

Figure 4: The Importance of Effective Warranty Management to the Company's Overall Performance



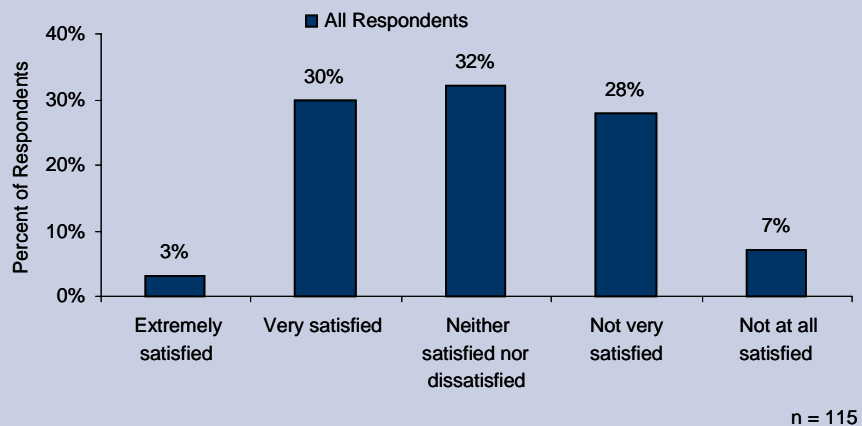
Source: Aberdeen Group, May 2010

The downside for a majority of organizations is that despite the high importance of the overall function, they are not presently happy with the performance of their company's current approach to warranty management, with more than a third (35%) indicating they are either "not very satisfied" or "not satisfied at all" (Figure 5). As such, the net outcome from this question is that more service organizations today are dissatisfied with their company's current approach to warranty management than are satisfied to any degree. This result signifies that while the warranty function itself is of high importance, there are few organizations that are currently satisfied with what they have in place – or where they are headed (i.e., only 45% of Best-in-Class firms are currently satisfied).

continued

Aberdeen Insights — Importance of Warranty Management vs. Satisfaction with the Company's Current Approach

Figure 5: Satisfaction with the Company's Current Approach to Warranty Management



Source: Aberdeen Group, May 2010

In the next chapter, we will see what the top performers are specifically doing to achieve these gains.

Chapter Two: Benchmarking Requirements for Success

The importance of warranty management has historically centered on the desire to reduce and / or contain costs and, as a by-product, keep customers more satisfied through a more structured warranty processing relationship. However, in recent years – and certainly in the current volatile economic environment – leading service organizations have found that effective warranty management not only helps to accomplish the historic goals of cost containment and enhanced customer satisfaction, but can also be counted on to create an incremental – and more predictable – service revenue stream supported by a more aggressive program of extended warranty sales and performance incentives for improving current warranty claims processes. Still, there remains a large gap between what Best-in-Class firms are able to gain from executing more effective warranty management, compared to what all others are able to achieve simply by relying on historical concerns such as warranty-related cost-cutting measures.

Case Study — Mitsubishi Caterpillar Forklift America Inc.

Mitsubishi Caterpillar Forklift America Inc. (MCFA) is a leading manufacturer of forklifts in the United States, Mexico, Canada and Latin America. The company manufactures and distributes three distinct brands – Mitsubishi forklift trucks, Cat® lift trucks and Jungheinrich® warehouse products – from its Houston headquarters. With the industry's most extensive dealer network in North, Central and South America, the company provides customers with quality products that range from warehousing to industrial applications and are backed by industry-leading customer service.

Four years ago, MCFA was challenged with creating a legacy warranty management solution, which required the manual transfer of information through multiple channels within the organization, adversely impacting both technology and process capabilities. Only some warranty claim information could be captured electronically and the solution was not user-friendly for internal or external stakeholders. All claims were printed; hard copy changes were noted and then manually input into a database.

The warranty claims processing system led to lost data, long processing windows, and unnecessary data capture. About 10% of the data stored was discarded as the claims analyst identified that the particular data was not relevant to their respective coverage area. The lack of quality data caused the company to miss out on opportunities to maximize resources throughout the organization as non-value added actions consumed the warranty process because of the need for additional staff to input the data.

continued

Fast Facts

- √ 73% of Best-in-Class firms presently have an end-to-end workflow process in place to handle warranty claim and product return operations, compared to 45% for Industry Average and 24% for Laggards
- √ 55% of Best-in-Class firms presently have a centralized data warehouse for product performance and warranty information in place, compared to 38% for Industry Average and 27% for Laggards
- √ 50% of Best-in-Class firms currently use a depot repair management system, compared to 33% for Industry Average and 24% for Laggards
- √ 45% of Best-in-Class firms currently use warranty reporting software, compared to 20% for Industry Average and 21% for Laggards
- √ 45% of Best-in-Class firms presently support their field-based service technicians with the ability to review warranty entitlements on each service job, compared to 38% for Industry Average and 27% for Laggards

Case Study — Mitsubishi Caterpillar Forklift America Inc.

To boost productivity, MCFA deployed a warranty management solution which transformed the warranty process from a manual undertaking to an automated workflow. A number of functionality changes transformed MCFA's ability to improve data quality and claims processing, including the ability to have workflow control of the solution within the functional business unit as opposed to an IT department, making changes as identified in real-time and providing a user-friendly interface that could be effectively leveraged by both internal stakeholders and customers. These three main attributes allowed MCFA to customize the solution and provide a quality warranty claims experience to its customers. Additionally, the new process allows the company to quickly take direct customer feedback and then incorporate those recommendations almost immediately. Prior to the implementation of this warranty management solution, customers often demanded a better and easier warranty work flow and the ability to receive feedback while a claim was in process. Automation of the system provided the perfect solution for all users.

As a result of transforming the warranty process, MCFA has seen improvements in both profitability and overall workforce efficiency. The company has been able to reduce its warranty claims personnel by over 50%, allowing it to shift resources to other areas of the company. MCFA has more than tripled the quantity of claims processed automatically, and has seen a 75% decrease in the time to process claims. These improvements in have helped MCFA navigate a poor economy while still offering quality service and warranty claim resolution to the customer.

MCFA continues to identify opportunities to expand the level of automation with the warranty claims process work flow, providing the opportunity to reallocate valuable resources to other aspects of the business in order to continue to drive revenue streams throughout the company.

“The faster we can get the dealers feedback on warranty claims, the faster they can react and make adjustments.”

~ Kevin Krakora, Director –
Product Service – Mitsubishi
Caterpillar Forklift America Inc.

Competitive Assessment

Aberdeen Group analyzed the aggregated metrics of surveyed companies to determine whether their performance ranked as Best-in-Class, Industry Average, or Laggard. In addition to having common performance levels, each class also shared characteristics in five key categories: (1) **process** (the approaches they take to implement, run and manage effective warranty management processes); (2) **organization** (corporate focus on the ability to support customers, and drive service revenue, through aggressive and effective warranty management); (3) **knowledge management** (making warranty management data and information easily available to key stakeholders, such as company executives and warranty administration managers); (4) **technology** (the selection of appropriate tools and effective deployment of those tools in supporting the organization's warranty management activities); and (5) **performance management** (the ability of the organization to measure and track key metrics, or performance indicators, to improve their business and contribute to both customer

satisfaction and the bottom line). These characteristics (identified in Table 3) serve as a guideline for best practices, and correlate directly with Best-in-Class performance across the key metrics.

Table 3: The Competitive Framework

	Best-in-Class	Average	Laggards
Process	End-to-end workflow process in place to handle warranty claim and product return operation		
	73%	45%	24%
	Regular, systematic measurement of claim processing time		
Organization	64%	48%	24%
	Ability for field-based service technicians to review warranty entitlements on each service job		
	45%	38%	27%
Knowledge	Multi-division collaboration:		
	41%	35%	18%
	Centralized data warehouse for product performance and warranty information		
	55%	38%	27%
Technology	Warranty operational and financial information delivered to all relevant stakeholders		
	45%	37%	18%
	Technology currently in use:		
	<ul style="list-style-type: none"> ▪ 86% ERP system ▪ 59% Warranty claims processing system ▪ 55% Customer Relationship Management (CRM) system ▪ 50% Depot repair management system ▪ 45% Warranty reporting software ▪ 35% Warranty analytics software 	<ul style="list-style-type: none"> ▪ 55% ERP system ▪ 35% Warranty claims processing system ▪ 42% Customer Relationship Management (CRM) system ▪ 33% Depot repair management system ▪ 20% Warranty reporting software ▪ 21% Warranty analytics software 	<ul style="list-style-type: none"> ▪ 33% ERP system ▪ 36% Warranty claims processing system ▪ 30% Customer Relationship Management (CRM) system ▪ 24% Depot repair management system ▪ 21% Warranty reporting software ▪ 6% Warranty analytics software
Performance	Regular, systematic measurement of warranty costs		
	68%	50%	36%
	Regular, systematic measurement of claim rates		
	59%	40%	24%

Source: Aberdeen Group, May 2010

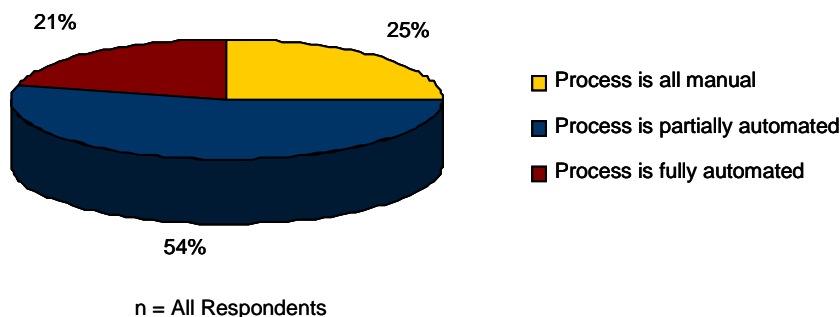
Capabilities and Enablers

Based on the findings of the Competitive Framework and interviews with end users, Aberdeen's analysis of Best-in-Class service organizations reveals a pronounced advantage over all others with respect to existing warranty management capabilities in key categories including end-to-end workflow process; regular, systematic measurement of key cost-, time- and performance-related metrics; and centralized data warehouse – all of which will be expounded upon within this chapter.

Process

The existence of a strong warranty management process is key to the chances for effective warranty management – yet many organizations presently find themselves at a disadvantage. Overall, only about one-in-five organizations (21%) are currently utilizing fully automated warranty management systems, while one-quarter (25%) are still saddled with all manual processes (Figure 6). This leaves just over half (54%) currently using a hybrid model comprised of both manual and automated processes. Thus, nearly four-fifths (79%) of respondent organizations presently manage their warranty chain activities with at least a partially manual process that, in many instances, results in increased manual time and costs to process warranty claims, decreased customer satisfaction, and a negative impact on the bottom line – as well as an opportunity cost for generating additional revenue through an expanded and / or more sophisticated warranty management operation.

Figure 6: Process Used in Support of Warranty Management



Source: Aberdeen Group, May 2010

The results of the current Aberdeen research also reveal that Best-in-Class firms have a substantial advantage over Industry Average and Laggard firms as nearly three-quarters (73%) presently have an end-to-end workflow process in place to handle warranty claim and product return operations (compared to only 45% and 24%, respectively). This is important since an end-to-end process fosters the ability to deliver a complete warranty management solution – a key determinant for meeting customer demand. In addition, Best-in-Class firms are much better prepared to regularly, and systematically, measure claim processing times, thereby allowing them to

“The biggest key is making sure our field staff is aware of current restrictions and return procedures, this way our field staff provides the needed documentation in order to capitalize on the opportunity. We are developing an ‘auto alert’ system to notify the field staff of possible warranty opportunities before they replace a part; they will get a notification that the part being replaced is suspect for warranty.”

~ Ken Staubitz, Director of Service - Modern Office Methods

provide stronger management over this critical time-sensitive component of the overall warranty process.

The most common warranty management process currently being deployed in the service segment is one where the service technician is dispatched to provide the on-site repair of under-warranty equipment (44%), as shown in Table 4. However, beyond this classic process, there are many additional modes of deployment currently being used depending largely on the service organization and the equipment and markets it serves. For example, less than one-in-five organizations (18%) utilize an advanced replacement process where replacement equipment is sent to the customer site before the failed equipment is returned to the depot for repair evaluation, and only one-in-seven accommodate customer walk-in traffic (14%). Still fewer either dispatch a service technician to perform an on-site replacement before returning to the repair depot (11%) or send a replacement unit to the customer after the failed unit is returned to the depot for repair evaluation.

What the data shows is that most service organizations treat warranty-related repairs in roughly the same classic sense that they treat non-warranty repairs, in that the most common type of support provided is to dispatch a field technician to either repair the unit on-site, or perform an on-site swap-out of the failed unit (55%, not including advanced replacement or post-failure replacement customer shipments). However, with each truck roll currently estimated at approximately \$276 (based on data reported in Aberdeen’s *The Evolution of Remote Product Service and the Emergence of Smart Services* report, published in April 2009), this model – even for some leading organizations – can quickly become quite expensive. As a result, it is in these areas where Best-in-Class firms likely gain some of their competitive cost advantages over all other firms.

Table 4: Warranty Management Processes Most Often Deployed

Process Deployed:	Percentage of all Respondents
Service technician dispatched to provide on-site repair of under-warranty equipment	44%
Replacement equipment sent to customer in response to customer call <u>before</u> failed equipment is returned to depot and evaluated for repair	18%
Customer returns failed equipment to repair location (walk-in)	14%
Service technician performs field replacement of failed equipment, and returns equipment to depot for repair	11%
Replacement equipment sent to customer in response to customer call <u>after</u> failed equipment is returned to depot and evaluated for repair	9%

Source: Aberdeen Group, May 2010

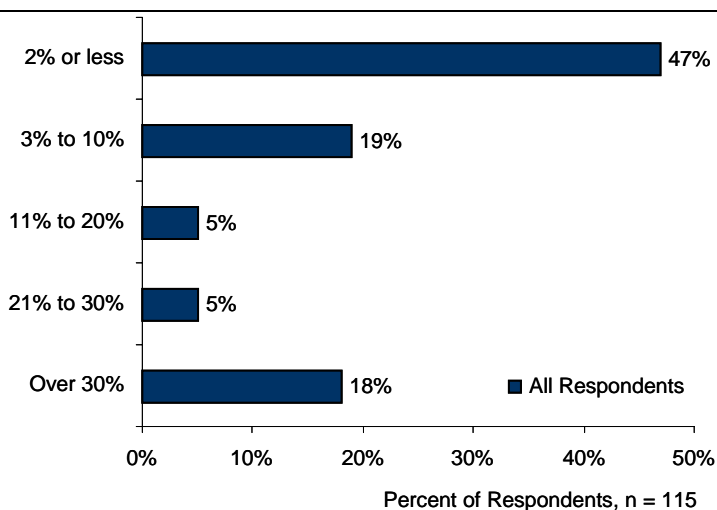
Organization

Best-in-Class firms reflect a modest – but important – advantage over Industry Average and Laggard firms in key organizational areas including the ability for field-based service technicians to review warranty entitlements on each service job (i.e., 45% for Best-in-Class, compared to 38% for Industry Average and 27% for Laggard firms), and multi-division collaboration (41% for Best-in-Class, compared to 35% for Industry Average and only 18% for Laggard firms). This is important because the ability to empower technicians to review warranty entitlements in the field, and individual company divisions to work together toward more effective warranty management provide these Best-in-Class firms with two distinct advantages over all others to ensure that their respective warranty-related tasks and activities can be performed quicker and more smoothly throughout the entire process.

A majority of Best-in-Class and Industry Average firms also consider senior executive (VP or higher) oversight of all warranty management activities an important strategic action (55% and 53%, respectively), while Laggard firms (at only 38%) have either not yet recognized the importance, or are unable to execute in this area (Figure 7).

However, perhaps an even stronger measure of the importance that the organization places on effective warranty management is the percent of total service revenue coming from the sale of extended warranties (Figure 8). While nearly half of all respondent firms report 2% or less of total service revenue coming from the sale of extended warranties, there are, nonetheless, nearly one-quarter (23%) for whom these sales comprise at least 20% of their service business – a key way to create an incremental service revenue stream.

Figure 7: Percent of the Organization's Total Service Revenue Coming from the Sale of Extended Warranties



“To improve the way in which we manage our warranty chain we are planning to report against our extended warranty program differently to view its profitability.”

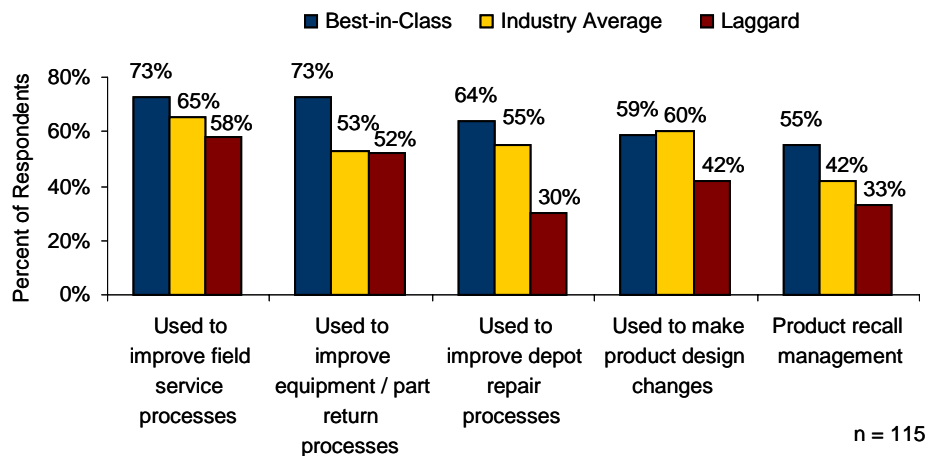
~ Director, Operations, Mid-Size North American Medical Device Company

Source: Aberdeen Group, May 2010

Knowledge Management

Effective warranty management requires more than simply performing warranty-related repairs efficiently – it is also dependent to a large degree on what data and information are collected, how they are processed, and, ultimately, how they are used. This is where knowledge management becomes an extremely useful tool – and where Best-in-Class firms once again reflect a significant advantage over all others. For example, nearly three-quarters of these leading firms currently use warranty claim-related information to improve field service processes or improve equipment / part return processes (73%, each), as shown in Figure 8. Another nearly two-thirds (64%) use warranty claim-related information to improve depot repair processes; and more than half use it to make product design changes (59%) or for product recall management (55%). It is also important to recognize that improvements in any of these individual areas will, likely, also result in cost savings that go directly to the bottom line.

Figure 8: Uses of Warranty Claim-related Information within the Organization



“The warranty tracking system we had previously relied on manual processes and ‘tribal knowledge’ to identify items under warranty. The new Maintenance system integrates the procurement process with the Maintenance Management system so that each item’s warranty period is tracked from receipt to installation to failure.”

~ Don Jones, Director
Procurement / Purchasing,
Tropical Shipping

Source: Aberdeen Group, May 2010

Other areas where Best-in-Class firms have a distinct advantage over all other companies is with respect to having a centralized data warehouse for product performance and warranty information (i.e., 55% for Best-in-Class, compared to 38% for Industry Average and 27% for Laggard firms), and warranty operational and financial information delivered to all relevant stakeholders (i.e., 45% for Best-in-Class, compared to 37% for Industry Average and only 18% for Laggard firms). The gaps between the Best-in-Class and all others in these key knowledge management areas provide the leading firms with an enhanced ability to not only gather key warranty-related data and information – but distribute it throughout the organization to key warranty management stakeholders.

Technology

For all primary types of technology enablers (with the exception of spreadsheets) Best-in-Class firms clearly outpace all others in terms of present utilization, particularly with respect to the following (Figure 9):

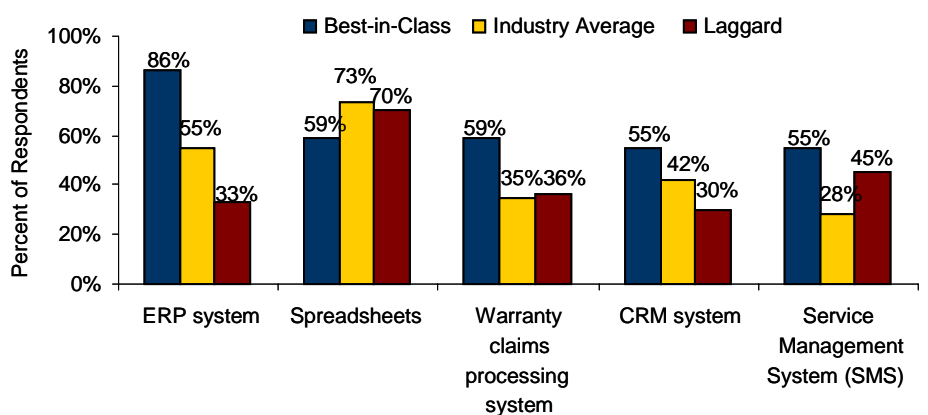
- Enterprise Resource Planning (ERP) system (86% for Best-in-Class, or 56% higher utilization than Industry Average)
- Warranty claims processing system (59% for Best-in-Class, or 69% higher utilization than Industry Average)
- Customer Relationship Management (CRM) system (55% for Best-in-Class, or 31% higher utilization than Industry Average)
- Service Management System (SMS) (55% for Best-in-Class, or nearly twice the utilization, or 96% higher than Industry Average)
- Depot repair management system (55% for Best-in-Class, or nearly twice the utilization, or 57% higher than Industry Average)

However, there are a number of other, less widely-used technologies for which Best-in-Class also reflect relatively higher adoption rates, such as:

- Warranty reporting software (50% for Best-in-Class, or more than twice the utilization, or 1.4 times higher than Industry Average)
- Warranty analytics software (35% for Best-in-Class, or 67% higher utilization than Industry Average)
- Product Lifecycle Management (PLM) system (35% for Best-in-Class, or nearly twice the utilization, or 94% higher than Industry Average)

All told, it is the aggregation of all of these key technology-related factors that ultimately distinguish Best-in-Class firms from all others – they have key technology more readily at their fingertips; they know how to use it; and they have the organizational wherewithal to ensure that it is used effectively.

Figure 9: Warranty Management Technology Enablers (Currently in Place)



n = 115

Source: Aberdeen Group, May 2010

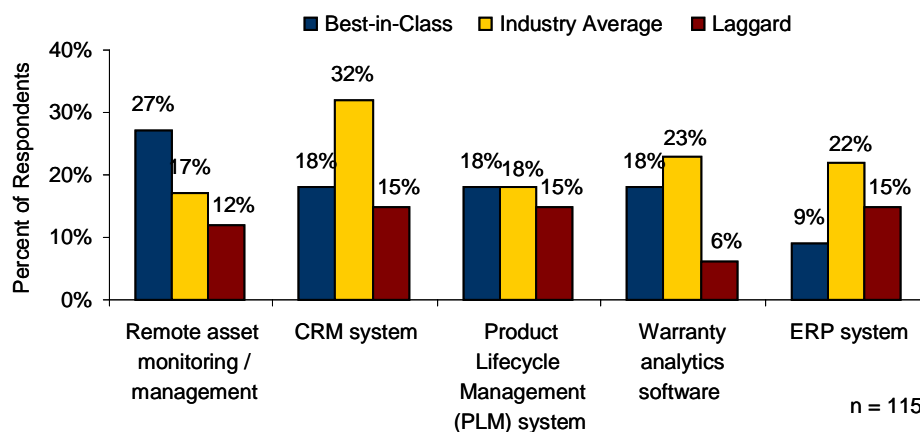
“Since the implementation of our warranty solution we have significantly more detailed data regarding our actual costs. We can track each individual repair and its cost. This significantly increases our ability to budget, reserve for warranty costs, and to appropriately define warranty costs. In our old system we had cross contamination between reporting against extended warranties and original warranties.”

~ Director, Operations and Medical Device Mid-Size North American Healthcare Company

Warranty management technology enablers planned for use within the next 12 months also differ by class of service organization (Figure 10) where Best-in-Class firms (many of which already have some of these enabling technologies in place) will be focusing primarily on newer technologies such as remote asset monitoring / management (27%), while Industry Average firms will still be getting around to the basics; for example, CRM system (32%) and ERP system (22%). Plus or minus one-in-five will also be looking to implement warranty management-specific technologies including warranty analytics software (18% planned usage for Best-in-Class, and 23% planned usage for Industry Average). As such, there appear to still be encouraging technology adoption rates over the next 12 months for both the basic enablers, as well as for warranty management-specific enablers.

However, while some Industry Average and Laggard firms scramble to adopt the technologies that many others in their respective classes have already put into place (e.g., CRM, SMS, others), it will be the Best-in-Class firms that take the technology to the next level by moving more toward remote asset monitoring / management, etc., to build in additional real-time capabilities that will eventually make their warranty-related processes move even quicker and more efficiently.

Figure 10: Warranty Management Technology Enablers (Planned for Use within the Next 12 Months)



“[Since the implementation of our warranty management solution] KPIs became comparable between the different country organizations, and costs went down substantially.”

~ Uwe Feil, General Manager
Technical Service & Support –
Toshiba Europe Computer
Systems

Source: Aberdeen Group, May 2010

Performance Management

Findings from Aberdeen's June 2009 study on [Service Benchmarking and Measurement - Using Metrics to Drive Customer Satisfaction and Profits](#) revealed that more than three-out-of-five (61%) of Best-in-Class firms have had KPI / metrics measuring programs in place for more than five years, compared to only 36% for Industry Average and 33% for Laggards. While it is important to measure Key Performance Indicators (KPIs), it is even more important to ensure that each organization has chosen the right KPIs to measure.

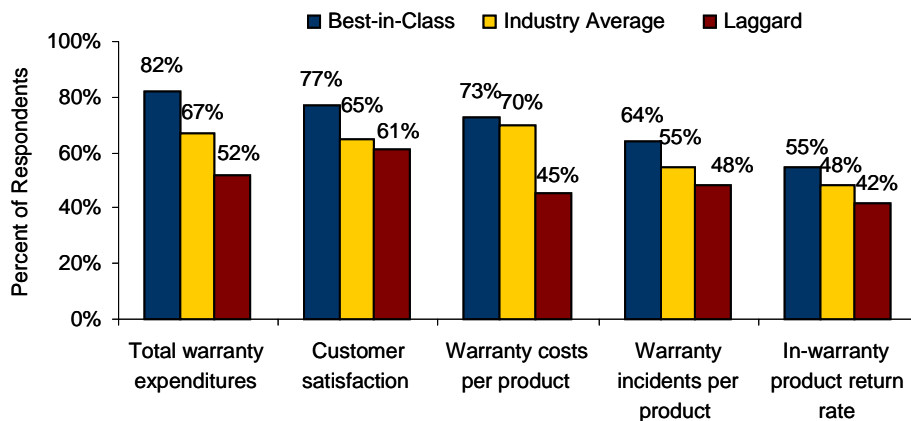
Again, Best-in-Class firms lead the way relative to all others with respect to measuring their warranty management performance based on key – and relevant –KPIs (Figure 11). The top two KPIs used by at least three-quarters of Best-in-Class firms to measure their respective warranty management performance are: total warranty expenditures (82%) and customer satisfaction (77%). At roughly two-thirds usage or higher, these leading firms also rely heavily on key metrics including: warranty costs per product (73%) and warranty incidents per product (64%). In-warranty product return rate, at 55%, is also used by a majority of Best-in-Class firms.

However, for a majority of Industry Average firms the mix of KPIs used is reduced by one (i.e., in-warranty product return rate), and the lead KPI (used by 70% or respondent firms in this class) is warranty costs per product. For Laggard firms, only two KPIs are used by a majority of organizations: namely, customer satisfaction (61%) and total warranty expenditures (52%). Thus, while a majority of Best-in-Class firms rely most heavily on warranty-related metrics and customer satisfaction; Industry Average firms focus on a similar set of KPIs, minus in-warranty product return rate; and Laggard firms place their focus more on a generic, rather than warranty-specific, KPI (i.e., customer satisfaction), supplemented by at least one warranty-specific KPI (i.e., total warranty expenditures). If the old adage holds true (i.e., you can't fix it if you can't measure it), then Laggard firms are clearly at a disadvantage when compared to Best-in-Class and Industry Average, and even Industry Average firms may not be looking hard enough at important KPIs such as in-warranty product return rate.

“We have seen increased profit margins because every warranty opportunity found is ‘found money.’ Keep in mind we did not invest in a separate warranty management solution package because we manage this through our current database management software.”

~ Ken Staubitz, Director of Service - Modern Office Methods

Figure 11: Top Key Performance Indicators Presently Used to Measure the Effectiveness of Warranty Management



n = 115

Source: Aberdeen Group, May 2010

“We have realized a 15% or more reduction in costs per annum since the implementation of our warranty management solution.”

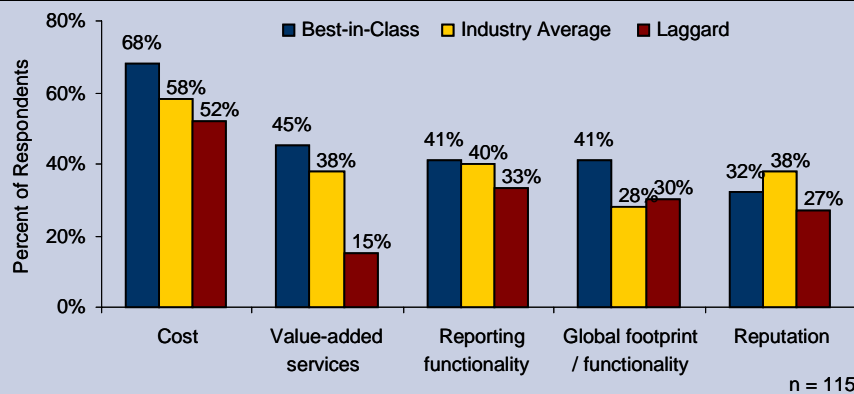
~ Director Logistics / Supply Chain - Large North American Computer Equipment Company

Aberdeen Insights — Top Attributes Firms Look for in a Warranty Management Solutions Provider

It is not surprising that a majority of respondents in each service organization class look first to cost as the primary warranty management solutions provider criterion – especially in today’s service economic environment. Similarities in the consideration of reporting functionality across organization classes is also not a surprise. However, where Best-in-Class firms (and at times, Industry Average) reflect more demanding criteria are in the areas of value-added services and global footprint / functionality (Figure 12). While most organizations, regardless of class, are looking for vendors offering cost-effective solutions, they also want their vendors to have the capability to provide them with adequate reporting functionality. Similarly, the consideration of vendor reputation is also fairly constant across classes.

However, Best-in-Class firms are also looking for value-added warranty management-related services (e.g., in-warranty product return support) and global footprint / functionality. In other words, they are looking for many of the same things that all other organizations are looking for, but they also want their vendors to provide more than just the basics, as well as with a more global focus.

Figure 12: Specific Attributes Considered when Selecting / Evaluating a Warranty Management Solutions Provider



Source: Aberdeen Group, May 2010

Chapter Three: Required Actions

Whether a company is trying to move its performance in warranty management from Laggard to Industry Average, or Industry Average to Best-in-Class, the following actions will help spur the necessary performance improvements:

For All Organizations

- **Increase the use of regular, systematic measurement of key warranty-specific metrics.** While a small majority of Best-in-Class firms currently conduct regular, systematic measurement of key warranty-related metrics (i.e., 65% warranty costs, 60% claim processing time, and 55% warranty claim rates), these numbers should be much higher within the class. In fact, less than half (45%) regularly and systematically measure detection-to correction time. With an average of 42% to 49% of Industry Average firms presently measuring these key metrics, there is not a sufficiently wide enough gap that suggests that the Best-in-Class have a distinct advantage based on their ability to measure – and act upon – these key metrics. Laggard firms fall even further behind all other classes at only 13% to 38% regularly and systematically measuring claim processing or detection-to-correction time, warranty costs or warranty claim rates. While Best-in-Class firms lead all others in this area, all three classes of organizations must step up to the regular and systematic measurement of these key warranty-specific metrics.

Laggard Steps to Success

- **Integrate warranty management more fully with service execution.** Presently, 44% of Laggard firms are taking actions to integrate their warranty management function with all other service functions, compared with 51% for Industry Average and 55% for Best-in-Class firms. Although the margins between classes are not great, Laggard firms still find themselves at somewhat of a disadvantage moving forward, in that by integrating these two highly-related functions within the organization, Laggard firms could benefit greatly from reduced incidences of warranty-related repairs and, thereby, reduced times and costs for overall warranty management, ultimately leading toward increased customer satisfaction. This could best be accomplished by integrating their warranty management activities more fully with service execution through a program of more active multi-division collaboration.
- **Appoint a senior executive manager with accountability for the overall warranty management function.** Laggards cannot expect to close the performance gap in warranty management among the classes if they do not maintain pace with Industry

Fast Facts

- √ Only 3% of Laggard firms presently have an incentive compensation plan in place based on claim processing efficiency; Best-in-Class firms are almost 7 times as likely to have such a plan in place
- √ Only 6% of Laggard firms are presently using warranty analytics software, compared to 21% for Industry Average and 35% for Best-in-Class
- √ Industry Average firms are 39% less likely than the Best-in-Class to have an end-to-end workflow process in place to handle warranty claim and product return operation
- √ Industry Average firms are 38% less likely than Best-in-Class to currently be using a warranty claims processing system
- √ Best-in-Class firms are 35% more likely than Industry Average firms to have the ability to disseminate warranty operational and financial information to all relevant stakeholders
- √ Best-in-Class firms are 67% more likely than Industry Average firms to currently be using warranty analytics software to support their warranty chain operations

Average or Best-in-Class firms in terms of appointing senior-level management with accountability to oversee the organization's warranty management function. Best-in-Class and Industry Average firms are 45% and 40% more likely than Laggards, respectively, to have this level of senior management oversight already in place, thereby setting the stage for better management of the overall warranty chain and, as a result, stronger contributions to the bottom line in terms of cost reductions and revenue maximization.

- **Close the warranty loop by introducing more automation into the system.** Only one-in-six Laggards firms (16%) presently have a closed-loop warranty management system in place, compared to more than twice that percent for Industry Average (33%) and 2.5 times that for Best-in-Class firms. Since disjointed or incomplete warranty chains are not as efficient as closed loop systems, Laggards will perpetually find themselves unable to perform their warranty management functions as efficiently as the leading (let alone Industry Average) firms. Only by introducing more automation into their warranty management (and related) systems, will Laggard firms be able to begin closing this gap.

Industry Average Steps to Success

- **Create a centralized data warehouse for product performance and warranty information.** The Best-in-Class are 28% more likely than Industry Average firms to presently have a centralized data warehouse for product performance and warranty information. This gives these leading firms a significant advantage in their ability to monitor, track, evaluate and assess their performance in key warranty management-related areas – some on a real-time basis. The ability to collect data and information to support a centralized data warehouse, coupled with the capability to use that information to measure performance and make the necessary improvements, is one way in which Industry Average firms can begin to manage their warranty chain operations more like the Best-in-Class, resulting in both improved operations and smaller performance gaps.
- **Establish an end-to-end workflow process to manage warranty claim and product return operations.** Less than half (46%) of Industry Average firms presently have an end-to-end workflow process in place to handle their warranty claim and product return operations, compared with three-quarters (75%) of Best-in-Class firms. An end-to-end workflow process is critical for maximizing the return on warranty chain operations in terms of performance-, time-, and cost-related factors – let alone customer satisfaction and retention. Presently, the Best-in-Class are almost two-thirds (63%) more likely than Industry Average firms to have this capability already in place, giving them a substantial advantage in key performance and financial areas.

“Within the next 12 to 36 months [we will] implement an electronic warranty claim process that is tied to the maintenance system.”

~ Don Jones, Director
Procurement / Purchasing,
Tropical Shipping

- **Make warranty operational and financial information readily available to all relevant stakeholders.** Best-in-Class firms are 35% more likely than Industry Average firms to have the capability to provide warranty operational and financial information to all relevant stakeholders within the organization. The ability to collect, process and evaluate these types of information are key factors in the ability to measure warranty-related performance. However, if the information is not also disseminated to all of the relevant stakeholders in the process, the organization will be missing a critical opportunity to empower its employees to manage their warranty chain activities effectively. Best-in-Class firms have already recognized the need to get the right data and information out to the right people on a regular and systematic basis. This is an advantage that Industry Average firms must also step up to in managing in their own warranty management organizations.

Best-in-Class Steps to Success

- **Increase the level of warranty management automation.** While a majority of Best-in-Class firms presently benefit from the use of company-wide solutions such as Enterprise Resource Planning (ERP) (85%), Service Management Systems (SMS) (60%), and Customer Relationship Management (CRM) (55%) they are far less likely to also be using certain warranty management-specific solutions. For example, while three-in-five organizations (60%) presently have a warranty claims processing system already in place, only half (50%) are presently using warranty reporting software, and only about one-third (35%) are presently using warranty analytics software. As there are many opportunities for creating enhanced warranty management-related revenue streams, reducing costs, and improving time- and customer satisfaction-related performance, stepping up to a more automated warranty management environment will help even the best-in-Class perform better.
- **Formalize (and / or expand) the internal program for maximizing the warranty revenue stream.** With 20% of Best-in-Class firms reporting that 30% or more of their annual service revenue presently comes from the sale of extended warranties, this area should be treated as a major focus of opportunity moving forward. To best capitalize on the opportunity, Best-in-Class firms will need to empower their service sales staffs with the right tools and incentives to ensure that they are able to maximize the sales of extended warranties. Therefore, it is recommended that a formal incentive program be put in place to foster and encourage service sales personnel to address extended warranties not only at the close of the original warranty period, but at the initiation of the customer relationship (e.g., in terms of extended warranties, multi-year warranties, upgraded and/or enhanced warranty packages, etc.).

“We plan to improve the way in which we manage our warranty chain through warranty entitlement accuracy, improved warranty recovery from suppliers, improved diagnostics, delivery partner performance management, and customer self-help.”

~ Director Logistics / Supply Chain - Large North American Computer Equipment Company

- **Establish an internal incentive compensation plan for stimulating improved claim processing efficiency.** Presently only 20% of Best-in-Class firms have an incentive compensation plan in place for warranty management staff based on claim processing efficiency or performance. While this percent compares favorably to 14% for Industry Average and only 3% for Laggards, it provides little overall comparative advantage for this class. However, by implementing a formal program to incentivize the warranty management staff to focus more on claim processing efficiency, process improvement, and multi-division collaboration within the organization, Best-in-Class firms are likely to reap the benefits (i.e., mainly financial) of an improved warranty management structure and operation – as well as increased warranty sales.

Aberdeen Insights — Required Action

While Best-in-Class firms reflect large comparative advantages in many key areas of warranty management over Industry Average firms (e.g., end-to-end workflow process in place, centralized data warehouse, etc.), they often find themselves only neck-and-neck with Industry Average firms for others (e.g., early warning process in place to alert of possible large scale and/or systemic product failures, ability to track in-warranty repairs at point of service, etc.). However, these all represent areas where all classes of service organizations – even the Best-in-Class – will need to focus on in order to maximize their ability to leverage effective warranty management as both a revenue stream generator and a cost-containment mechanism.

“In general, products are performing in line with our expectation and we have good data on the level of issues at install, call rate, and returns so the problem is bounded and measured. We lack the infrastructure to capture the next level of data to take actions through to warranty recovery from our suppliers. There is a significant cost opportunity that we can deliver in 2010. This will come through improved root cause resolution and through better links back to supplier warranty.”

~ Supply Chain Operations
Director, Communications and
Office Products Company

Appendix A: Research Methodology

Between March and April 2010, Aberdeen examined the use, the experiences, and the intentions of 115 enterprises engaged in the use of warranty management tools and solutions.

Aberdeen supplemented this online survey effort with interviews with select survey respondents, gathering additional information on effective warranty management strategies, experiences, and results.

Responding enterprises included the following:

- *Job title:* The research sample included respondents with the following job titles: Manager (37%); Director (23%); GM / Managing Director / Partner / Principal (13%); EVP / SVP / VP (13%); CEO / President (7%); and other (7%).
- *Department / function:* The research sample included respondents from the following departments or functions: corporate / service management (29%); customer service / support (18%); business development / sales / marketing staff (15%); operations (12%); logistics / supply chain (7%); field service (5%); and other (14%).
- *Industry:* The research sample included respondents from the following industry segments: computer equipment / peripherals / hardware / software (18%); consumer electronics / durables / packaged goods (14%); industrial equipment / product manufacturing (13%); health / medical / dental (10%); IT consulting / services (8%); field / repair services (6%); telecom equipment / services (5%); automotive (4%); transportation / logistics / wholesale / distribution (4%); retail (3%); and other (15%).
- *Geography:* The majority of respondents (71%) were from North America. Remaining respondents were from Europe / Middle East / Africa (20%); and the Asia-Pacific region (9%).
- *Company size:* Seven percent (7%) of respondents were from large enterprises (annual revenues above US \$1 billion); 26% were from midsize enterprises (annual revenues between \$50 million and \$1 billion); and 67% of respondents were from small businesses (annual revenues of \$50 million or less).
- *Headcount:* Forty-one percent (41%) of respondents were from large enterprises (headcount greater than 1,000 employees); 27% were from midsize enterprises (headcount between 100 and 999 employees); and 32% of respondents were from small businesses (headcount between 1 and 99 employees).

Study Focus

Responding executives involved in the warranty management process within their respective service organizations completed an online survey that included questions designed to determine the following:

- √ The degree to which warranty management is automated within the organization, to what extent, and with what return
- √ The linkage between warranty management and service performance
- √ The top pressures being faced with respect to warranty management and what strategic actions are being taken to address them
- √ Internal capabilities presently in place to facilitate effective warranty management
- √ Top challenges for implementing effective warranty management
- √ Current and planned automation and delivery models
- √ Technology enablers utilized

The study aimed to identify emerging best practices for warranty management, and to provide a framework by which readers could assess their own management capabilities.

Table 5: The PACE Framework Key

Overview
<p>Aberdeen applies a methodology to benchmark research that evaluates the business pressures, actions, capabilities, and enablers (PACE) that indicate corporate behavior in specific business processes. These terms are defined as follows:</p> <p>Pressures — external forces that impact an organization’s market position, competitiveness, or business operations (e.g., economic, political and regulatory, technology, changing customer preferences, competitive)</p> <p>Actions — the strategic approaches that an organization takes in response to industry pressures (e.g., align the corporate business model to leverage industry opportunities, such as product / service strategy, target markets, financial strategy, go-to-market, and sales strategy)</p> <p>Capabilities — the business process competencies required to execute corporate strategy (e.g., skilled people, brand, market positioning, viable products / services, ecosystem partners, financing)</p> <p>Enablers — the key functionality of technology solutions required to support the organization’s enabling business practices (e.g., development platform, applications, network connectivity, user interface, training and support, partner interfaces, data cleansing, and management)</p>

Source: Aberdeen Group, May 2010

Table 6: The Competitive Framework Key

Overview	
<p>The Aberdeen Competitive Framework defines enterprises as falling into one of the following three levels of practices and performance:</p> <p>Best-in-Class (20%) — Practices that are the best currently being employed and are significantly superior to the Industry Average, and result in the top industry performance.</p> <p>Industry Average (50%) — Practices that represent the average or norm, and result in average industry performance.</p> <p>Laggards (30%) — Practices that are significantly behind the average of the industry, and result in below average performance.</p>	<p>In the following categories:</p> <p>Process — What is the scope of process standardization? What is the efficiency and effectiveness of this process?</p> <p>Organization — How is your company currently organized to manage and optimize this particular process?</p> <p>Knowledge — What visibility do you have into key data and intelligence required to manage this process?</p> <p>Technology — What level of automation have you used to support this process? How is this automation integrated and aligned?</p> <p>Performance — What do you measure? How frequently? What’s your actual performance?</p>

Source: Aberdeen Group, May 2010

Table 7: The Relationship Between PACE and the Competitive Framework

PACE and the Competitive Framework – How They Interact
<p>Aberdeen research indicates that companies that identify the most influential pressures and take the most transformational and effective actions are most likely to achieve superior performance. The level of competitive performance that a company achieves is strongly determined by the PACE choices that they make and how well they execute those decisions.</p>

Source: Aberdeen Group, May 2010

Appendix B: Related Aberdeen Research

Related Aberdeen research that forms a companion or reference to this report includes:

- [Reverse Logistics: Driving Improved Returns Directly to the Bottom Line](#); February 2010
- [The Chief Service officer's Guide to Service Revenue: Building a Sustainable Service Enterprise](#); January 2010
- [The State of Service Management: Forecast for 2010](#); October 2009
- [Service Benchmarking and Measurement: Using Metrics to Drive Customer Satisfaction and Profits](#); June 2009
- [Service Contract Management: Winning Strategies for Managing Customers' Expectations](#); March 2009
- [Forging the Warranty Chain](#); May 2008
- [Optimizing the Service Supply Chain](#); September 2007

Information on these and any other Aberdeen publications can be found at www.aberdeen.com.

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