

Identifying and Reducing Warranty Costs in Your Organization

A Guidebook for Embarking on a Program to Cut Costs Related to Warranties

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Executive Summary

The purpose of this white paper is to assist you in the effort to measure all costs associated with product warranties at your company and estimate the potential warranty cost savings.

Considering that some companies have total warranty costs equal to their R&D spending, achieving savings in this often overlooked area can result in significant improvements to the bottom line.

Warranty: An Area Ripe for Cost Savings

The area of warranty costs is ripe for savings, yet has been neglected until now. Businesses are waking up to the fact that warranty claims processing, shipments, payments, and other associated activities suffer from the *leaky pipe syndrome*. The leaky pipe syndrome describes a situation where costs add up through many small, continuous losses throughout the entire warranty process from initial repairs through acceptance or denial of a claim to examination of returned parts and on to recovery of claim money from suppliers.

This leaky pipe situation has most likely come about because in today's companies, authority and responsibility for warranty activity tends to be scattered over several departments: customer service, claims processing, quality, RMAs, purchasing (supplier recovery), engineering and production. Each department is involved in certain aspects of warranties, but no single department is responsible for all warranty activities.

Companies looking for significant improvements to the bottom line owe it to their stakeholders to launch warranty cost saving initiatives. While the potential for savings differs from one company or industry to another, being affected by product complexity, expense, and the duration and extent of warranty coverage, it is not unrealistic to aim for and achieve a 50% reduction in warranty cost through a combination of costs saving initiatives that slow or stop leaking costs at many points.

Benefiting from the Warranty Chain Perspective

The concept of the warranty chain is emphasized in this paper because of its effect on increasing the scope of warranty cost savings. Like the supply chain for purchasing and manufacturing, the warranty chain extends the scope of warranty activities beyond the walls of a single company to encompass suppliers, manufacturers, OEMs, distributors, dealers, repair centers, policy carriers, and customers.

Just as the integration of data and activities up and down the supply chain leads to cost savings, so does the integration of claims submission, claims processing, RMAs, quality improvement, and supplier recovery along the entire warranty chain.

This white paper provides several examples of how warranty costs involve a chain that includes service centers, manufacturers, and suppliers. By looking to cut costs along the entire chain, you achieve more savings that directly affect the bottom line.

It is not unrealistic to aim for a 50% reduction in warranty costs through a committed and coordinated program of cost saving initiatives

Understanding Your Company's Savings Potential

Once you have identified a number of warranty cost saving possibilities for your company as a result of working through this white paper, it's important to understand which initiatives yield the most savings in the shortest time. Your company's situation will be unique. Some guidelines and formulas are provided to help with measuring the savings potential, so that you embark on an effort that achieves results faster.

It is also important to understand the most effective order in which to launch cost cutting initiatives, so that early savings in one area can be used to free up resources to cut costs elsewhere. For example, it is worth measuring whether the additional cost of automating claims approval by simply approving more claims outright can be justified by the savings achieved from shifting staff to resolution of product quality issues which result in warranty claims. The answer to this will depend upon the specific estimates you develop based on this white paper.

Finally, different initiatives produce results within different time-frames. For example: Operational initiatives targeting claims processing can yield cost savings within six months. By contrast, quality improvement initiatives may only begin to produce significant savings after two years.

Ongoing Cost Savings

Warranty cost savings have greater impact on your company's bottom line because, like other cost cutting initiatives, the result is continuing savings over several years. The sooner you begin, the sooner you realize the savings.

However, the introduction of new products or new supplier parts means that efforts to streamline and automate claims processing as well as resolve product quality problems will continue as the product line changes.

Because of the leaky pipe nature of warranty costs and the potential savings, even narrowly focused efforts can reward you with immediate, steady, and long term savings.

"Everyone thinks they have control of the most important part (of a warranty management system). Product life-cycle management software has all the engineering information, and ERP has all the business information."

– Kevin Prouty, Gartner G2, Information Week, July 7, 2003

Areas for Cost Recovery

The first step in an effort to save on warranties is to identify all the associated costs at a company. This section describes those potential costs.

Unfortunately, the task of uncovering costs is made more difficult by the fact that in most companies, management of warranties is scattered over various independently functioning parts of the organization. The Claims department may view warranties as its responsibility—yet so does Accounting, the Depot or Repair center, Customer Service, Engineering, or the Quality department. Many people get involved with warranties, but no one has overall management responsibility. The search for savings may lead to many departments and many job titles in several locations.

In addition, each company faces a different situation in terms of claims processing, repair costs, relationships with suppliers, and quality initiatives. Therefore the costs enumerated below serve as a master list from which items can be selected or eliminated as appropriate.

Each of the major areas described below breaks out the detailed costs in a separate section.

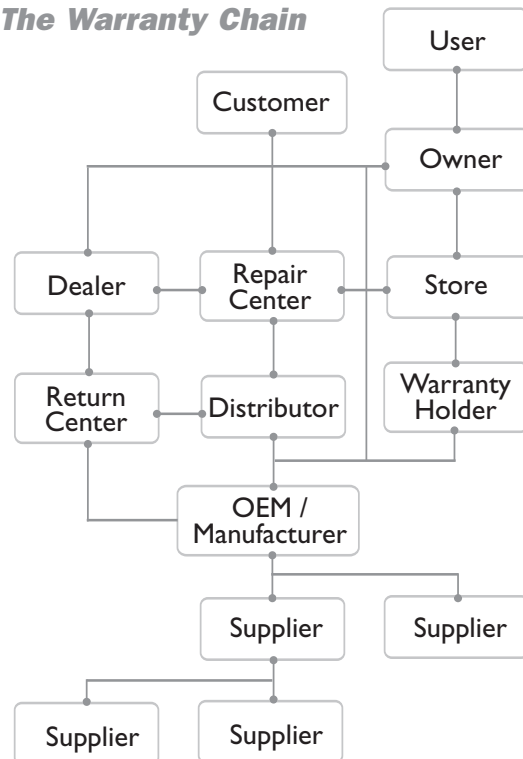
- Claims processing - the entry, review, and acceptance or denial of warranty claims.
- Parts return - the request, receipt, diagnosis, and repair of broken parts removed as part of repair work covered under warranty.
- Supplier recovery - the recuperation from suppliers of costs for warranty claims when covered supplier parts cause the malfunction.
- Quality improvement - the analysis of warranty claims to eliminate future costs through changes in design and manufacturing.
- Warranty reserves - the estimation and setting aside of reserves as required by accounting rules to cover future warranty costs.
- Dealers and repair centers - the entry and submission of claims as well as logging of all repair work covered under warranty.

The Warranty Chain Concept

When considering warranty issues, an important concept to keep in mind is the warranty chain. Like the supply chain for purchasing and manufacturing, the warranty chain extends the scope of warranty activities beyond the walls of a single company to encompass suppliers, manufacturers, OEMs, distributors, dealers, repair centers, policy carriers, and customers.

Just as the integration of data and activities up and down the supply chain leads to cost savings, so does the integration of claims submission, claims processing, RMAs, quality improvement, and supplier recovery along the entire warranty chain.

The Warranty Chain



Claims Processing

Claims processing refers to the entry, review, and acceptance or denial of warranty claims. In most organizations, this is a labor intensive, time consuming process that is prone to questions, delays, and back-and-forth communication and paperwork between manufacturers, distributors, dealers, and repair centers.

Claims Processing Workflow



Claims Processing Costs To identify costs incurred by claims processing, it helps to understand a claims processing department as an equivalent to an accounts receivable or shipping department. Each claim, like an invoice or shipment, takes on average a certain amount of time to complete. Therefore, the size of your accounts receivable operations is determined by the number of invoices you process. In the same way, you set warranty claims processing head-count to be sufficient to handle the number of claims you process each year.

While no statistics exist on the amount of time spent on an individual warranty claim, given that employees are processing many claims at the same time, a claim typically takes 30 to 90 days to process from the time it is submitted to the time it is accepted or rejected, and paid. Labor costs are a major part of claims processing.

There are two possibilities for cutting employee costs for processing warranty claims. The first is to process claims faster. If you process claims 20% faster you can cut headcount for claims clerks by 20%.

A second cost cutting potential comes from a better understanding of workload trends and patterns, allowing for more flexible staffing in terms of hours and shifts to keep staffing lean.

Along with staff comes the cost of typical office equipment such as computers, telephones and copiers, and the facilities to house the department.

Field Costs At many companies personnel in the field, whether technicians or supervisors, review claims and approve them for forwarding on to the claims center. Costs associated with this are both in terms of labor and delays.

Catalog Costs This includes bulky printed catalogs of parts and components subject to repair. There are also written policies specifying whether a repair is covered by warranty, and under what conditions, along with reimbursement limits. The more complex the products you manufacture, the thicker these documents are. Also, each claim results in a paper file including details about the repair, possibly with diagrams and photos.

Invalid Claims Finally, there is a cost related to claims processing that isn't related to the cost of processing them. By way of comparison, Accounts Payable is not just about processing payments quickly, but also about not overpaying for goods and services. Similarly, incorrectly paying claims for expensive repairs which are not in fact covered under warranty results in significant over-payments. It is estimated that between 10% and 15% of claims paid should not be covered. The cost of failing to detect invalid claims and deny coverage is a function not merely of claims processing time but also most importantly of the money spent to reimburse service and parts. The problem with invalid claims that are the result of mistakes is compounded by fraudulent claims submitted by repair centers. This takes the form of claims for items not covered under warranty, and also "double dipping," or repeat submission of a claim for the same repair.

Parts Return (RMAs)

The subject of returned parts, or Return Merchandise Authorizations (RMAs), covers the request, receipt, diagnosis, and repair of broken parts removed as part of repair work or replacement covered under warranty.

Certain parts a company manufactures may be designated as RMA parts, meaning that when a warranty claim is made, the company requires that the broken parts be returned. The main reasons a part would be designated as returnable are:

- The part or assembly is expensive, therefore it is important to verify that it is in fact broken and study it to determine the cause of the malfunction.
- The part is an assembly where the malfunction could be due to one of several component parts, therefore it is important to inspect it to determine which component is the cause.
- The part or its components are from a supplier or vendor who requires return of the parts in order to reimburse the company for a warranty claim.

- The part or assembly can be refurbished and returned to working inventory.
- Portions of the part or assembly can be returned as-is to working inventory.
- The company requires parts to be returned to prevent fraudulent claims.

The costs related to RMAs consist of the cost of tracking and processing, along with the cost savings when replenishing inventory and cost savings resulting from feeding breakdown information into the quality improvement process. We will look at these in more detail.

The RMA operation—often called a depot—is similar to a repair center, and has costs for labor, facilities, repair equipment and consumable parts. The scope of a depot may go well beyond warranty parts - it may be customary for a manufacturer to refurbish all occurrences of specific parts, such as toner cartridges, whether they malfunctioned or not. Potential savings specifically related to warranty are described in the column to the right. While potential cost savings exist in the repair operations themselves, that is not the focus of this discussion of warranty related savings. The RMA process is a perfect example of a process that is subject to the leaky pipe syndrome presented in the *Executive Summary*. At each step in the process the potential for loss of parts exists.

ROI Calculator

Entigo Corporation produces an ROI calculator which includes a fine grained breakdown of labor costs associated with warranty processing. It takes into account different tasks, individuals, salaries, and overhead multipliers, and provides standard cost figures for reference. See the Cost Saving Tools section on page 15.

Omitted RMAs To begin with, when a warranty claim is first submitted, it is critical to identify a part as requiring an RMA. For all the claims submitted that should involve a returned part, a certain percentage fail to request the part. Because RMAs are used to cut costs for your company—either directly by resupplying inventory more cheaply than with new parts, or indirectly by providing a feed into the quality improvement process in order to reduce costs down the line—each part that doesn't get requested is a cost.

Omitted Supplier Recovery If an RMA part is from a vendor or supplier who requires it in order to reimburse your company for a claim that you have already paid, you incur another direct cost by failing to request an RMA part.

Omitted Shipments After an RMA is created, the part must be shipped to your company. A certain percentage of these parts are never shipped. Each part that fails to ship or is shipped to an incorrect location represents lost savings.

Labor Costs for Tracking Your company may work with many different parts and components that must be flagged for return. Parts are due in from what may be thousands of

repair centers or distributors. When done manually, tracking requested RMAs is a labor intensive process of sorting through stacks of papers and making phone calls to distributors, dealers, and the receiving dock. RMA tracking costs can be cut by automating the following action: flagging a part for return and requesting it, printing required shipping documents, sending reminders for parts not received, and recording receipt of requested parts.

Unnecessary Shipments Finally, the process of inspecting RMAs for defects tends to be concentrated around a specific point of the product life-cycle. When a new product or version is first sold, RMAs result in design and production fixes. After a time the number of RMAs showing new causes drops off as problems are fixed. At a certain point, it becomes counter-productive to continue to request RMAs for the part. RMA problems only reflect known defects in the early inventory, still being sold, that have already been fixed. Yet with each RMA your company incurs shipping costs. Therefore an important focus for savings is having the information necessary on problem trends to know when to discontinue return shipment. You also need the ability to immediately change your warranty claims process to stop further shipments. In many outdated mainframe warranty systems, it is not possible to create such a flexible rule.

A further problem with unnecessary shipments is the cost to house the returned inventory. Unwanted returned parts often take up significant warehouse or facility space. Some companies allocate entire portions of their buildings to handle such parts.

Note:

This section does not examine costs related to maintaining a spare parts inventory, which is significant at certain companies.

Supplier Recovery

Supplier recovery is the recuperation of costs from suppliers for warranty claims when covered supplier parts are the cause of the malfunction. With large ticket warranty repairs, this can be an area of significant cost savings for your company. The importance of developing a warranty chain perspective (see page 2) for more effective cost savings is illustrated with supplier recovery. Often an owner or customer is three or four steps removed from the maker of a component part who is ultimately responsible for covering the warranty cost. As a company reimbursing warranty claims, it is vital that you identify when the financial responsibility for a malfunction lies in a part belonging to your supplier, or to your supplier's vendor, so that you can request reimbursement and track payment.

The chain of suppliers is quite long with today's situation of increasingly complex assemblies, as well as increased outsourcing of subassemblies. A piece of equipment may have a component from Supplier A that uses a subassembly from Supplier B, made with parts from Suppliers C, D, and E.

In some cases supplier responsibility for a malfunction is easy to determine. This situation involves two major costs: failure to request reimbursement, and failure to obtain payment from your vendor. Both are examples of the "leaky pipe syndrome." At each step in the process, reimbursements can be lost during a labor-intensive process involving receiving paperwork from repair centers, passing the information along to vendors, following up on receipt of information, and monitoring payment.

Other cases are more complex. These are cases where it isn't evident that a supplier is responsible. Detecting supplier responsibility is costly not only in terms of delays in mailing paperwork down the chain but also in manpower spent chasing paperwork and information and analyzing scattered paper materials to determine the cause.

Some operations fail entirely to recover costs for entire products and product lines, because nobody keeps on top all the warranty conditions for different parts, different types of parts, and different suppliers. When a company has 50 suppliers, each with different policies for different parts, it is easy to miss opportunities for recovering cost. Depending upon its situation, your company may have the potential to recover twice as much money from suppliers as it does today.

Quality Improvement

Quality improvement with the warranty process consists of analyzing warranty problems to eliminate future costs through changes in design and manufacturing. If an operation doesn't have a system in place that measures the impact of quality improvements on costs, this is the hardest area of warranty activity to measure cost savings. Yet cost savings can be substantial, because a single quality improvement to a part's design and manufacture leads to cost savings with every batch produced, cutting the number of future warranty claims.

The principle challenge to quality improvement efforts is the inadequate, inconsistent, and incomplete collection of data at the point of repair to provide the information necessary to analyze and identify the cause of a problem. If your company, rather than being in the position of directly covering a part, is instead a supplier receiving a claim from a manufacturer or OEM that incorporates your part in its product, the problem gets worse each time information jumps from one link in the warranty chain (explained on page 2) to another.

In today's world much of the repair data collection is done on paper. Unless your operation enforces complete data entry before it reimburses a claim, it is all too easy to leave fields blank, omitting data that could make all the difference in understanding the source of a malfunction. The only way to remedy this is to have a system—manual or automated—that forces all involved to enter complete information.

Quality analysis becomes even more complicated by the fact that the cause can be internal, in which case the goal is to fix the design and production line, or with a vendor part, in which case the goal is recovery, or due to the installation, in which case communication

and training are needed, along with possible denial of claims to repair centers who incorrectly install the product.

Installation as a cause of failure highlights the importance of the service center and its integration into the warranty chain for your company. Breakdowns do not necessarily result from a flaw in a part or assembly, but can result from placement or use that is not according to spec (i.e. incorrect connection, use of the wrong grade of engine oil, etc.).

For example, one transmission manufacturer was able to determine that the vehicle (based on the VIN or Vehicle Identification Number) had a transmission replaced three times. An investigation determined the problem was with the installation, not the part. Without the VIN information, this same expensive and entirely unnecessary warranty cost—not just for the part but for the labor—would have recurred. The same holds true for disc drives in a PC, where unnecessary replacement is quite expensive relative to the cost of the PC.

Time delays from the initial trend of claim submission for a single problem, through the point where analysis identifies a problem, to design changes, and finally on to changes to the manufacturing line can be significant at many companies. It is common to see 60 to 90 days to submit claims, 90 more days before a pattern is identified, and other 18 months before the fix is rolled out to the production line. That represents two years producing parts prone to a reported problem, an established percentage of which will require repairs covered by warranty.

Warranty Reserves

The warranty reserve process consists of estimating and setting aside reserves as required by accounting rules to cover future warranty costs.

Warranty reserves, like all line items on corporate financial statements, are subject to increased scrutiny by corporate officers legally liable for the accuracy of the numbers. Publicly held U.S. companies are now required to supply more detail on warranty disbursements and reserves, beginning in the first quarter of 2003.

Accurately estimating warranty reserves has historically been difficult. The quality of the results depend upon incomplete figures on warranty costs for established products, and on guesstimates for new products, which may or may not be similar to existing products, in terms of warranty costs.

Yet the impact of over- or under-estimating reserves has a direct effect on the bottom line. The goal is to create as accurate a forecast of future warranty costs as possible, to minimize the cost of unrecognized revenue when reserves are higher than needed, and to avoid unanticipated increases to the reserve for unexpected rises in warranty costs.

Detailed information on claims paid, trends in claims payments, and claims payment patterns over the product life-cycle, broken out by product, provides Finance with an accurate picture of reserve requirements.

Dealers and Repair Centers

The final area of warranty costs also demonstrates the value of using the warranty chain perspective (see page 2.) in order to maximize savings. This is the entry and submission of claims, as well as logging of all repair work covered under warranty done by your company's repair centers, dealers, distributors, retail outlets, and by staff in the claims processing centers.

Today, your company may record claims in a number of ways. If no automated warranty system exists, then claims are filled out on paper forms at the location where the repair is performed. These forms are sent to a claims processing center.

If an automated system exists for processing warranty claims, then chances are it runs on a mainframe not accessible to repair centers for entering claims in real time. Either paper forms are entered on the system by your claims processing center, or a repair center has an independent system to enter claims, after which batches of claims are loaded on the mainframe system.

Communication between the systems for the claims processing center and the one for repair centers or distributors may or may not be two-way. Two-way communication means that repair centers can go on their system to follow up on claims and see reimbursement status. If communication is only one-way, then repair centers must call in to the claims processing center to follow up on claims.

And Then There's Fraud

Many manufacturers suspect that fraudulent warranty claims are being submitted by repair centers. However, without an automated way to flag suspicious claims, the process of investigating their validity is discouragingly labor intensive. Repair centers discover that there are ways to present non-covered repairs in such a way as to get them covered, or simply submit a repair as covered when it isn't. Also, claims for the same repair are submitted multiple times, by accident or by design.

The need for communication between many different repair centers and the claims processing center can give rise to extensive labor costs to re-key claim and customer information, and to follow up on claims via telephone or written request. The potential for savings comes from providing the ability for many individuals at many repair centers, distributor locations, or retail outlets to enter claims online, and to follow up on those claims online as well. It may also be appropriate to consider the cost of supplies such as printed catalogs and parts lists, costs which can be reduced through online part lookup and catalog information.

A further area for cost savings is in automating communication of claim acceptance or denial, as well as questions and requests for further information by the claims processing department, and responses from repair centers, including the ability to electronically transmit supporting documentation, pictures, etc.

Many Areas for Cost Savings

Having determined costs for various areas in the warranty chain, it is clear that there are many elements contributing to warranty costs and several areas of potential cost savings. A cost checklist is provided on page 8 for easy reference when investigating warranty costs in your organization. After identifying costs, the next step in a savings initiative is to measure potential savings for each cost, in order to focus on areas with the highest potential savings.

Warranty Costs Inclusive Checklist

- Claims processing
 - Labor
 - Equipment
 - Office space
 - Supplies
 - Catalogs
 - Files
 - Guidelines
 - Claim forms
 - Invalid payments
 - Return shipping
 - Staff scheduling
 - Training
- Return parts
 - Lost returns
 - Omitted returns
 - Repair costs
 - Labor
 - Parts
 - Facilities
 - Unnecessary shipments
- Supplier recovery
 - Omitted requests
 - Collection
 - Detecting supplier responsibility
- Quality improvement
 - Early fixes
 - Internal causes
 - Supplier causes
 - Installation causes
- Warranty Reserves
- Dealers/Repair Centers
 - Registrations
 - Claims entry
 - Logging repairs
 - Claims submission
 - Reimbursement delays

Measuring Potential Cost Savings

This section covers the step after identifying warranty costs, namely considering different methods for measuring potential savings. It provides guidelines to pinpoint those areas at your company with the greatest savings potential. There is also a brief discussion of differences in potential savings by industry.

At appropriate points in this section, specific cost saving initiatives are mentioned. These various initiatives are listed and described more completely under the *Cost Saving Initiatives* section on page 14.

Potential savings are organized into the same areas used to describe warranty costs in the previous section. These areas are listed on page 4. Before discussing each individual area, it's worth taking a brief look at total warranty costs.

Total Warranty Costs - Some Industry Benchmarks

The table below provides averages in various industries for warranty costs as a percent of revenues. These are based on costs reported in quarterly statements, and may include only payment of claims, excluding such things as claims processing and warehousing of RMAs. To see how your company compares to industry averages, the third column provides a translation into cost for every \$1 billion of revenue.

Warranty Costs - Q1 2003

Industry	% of Revenues	Per \$1 Billion in Revenue
Automotive	1.7%	\$17 Million
Computers	1.8%	\$18 Million
Manufacturing	1.5%	\$15 Million
Telecommunications	1.8%	\$18 Million

Source: *Warranty Week, June 9, 2003*
Analysis of top 441 US Owned Warranty Payers

Claims Processing - Potential Savings

The first component of claims processing cost is the expense of actually processing claims. There are two options for calculating potential savings here. The first is to treat savings as a single figure based on fully loaded labor cost that includes the facilities, equipment, and supplies associated with claims processing. This is the simpler option since you can use your company's formula to derive a fully loaded cost.

Savings on Catalog Costs The second option is to break out savings on supplies, specifically printed catalogs used for determining warranty coverage and approved repair costs, from the rest of the savings. You would use this second option if catalog creation, maintenance, production and distribution is a significant cost at your company's warranty operations.

Consider separately tracking potential savings on catalogs when any of the following applies:

- Your product is complex, consisting of many components, assemblies, and sub-assemblies.
- You have a distribution, retail outlet, dealer or service center network made up of many locations which need to access part information.
- Your internal warranty operations are housed in multiple locations.
- Your catalogs contain guidelines for repair costs.

By moving the catalog online and tying it into a warranty system savings on catalog cost are that much greater if your company does not have complete online parts lists and catalogs today.

Labor Cost Savings Savings on claims processing work will come from automating claims processing, including automating review and acceptance of claims. In many systems today—most existing systems run on a mainframe and were developed in-house—20% of claims are processed automatically and 80% require manual intervention. (Automated claims involve no labor in the claims processing center).

By implementing a system that allows your company to take the rules used to accept claims—currently in the heads of experienced claims processors—and build them into the system, you can reach 80% automatic processing of claims.

Claims Processing Labor Cost Savings:

Manual/Automatic Processing from
80/20% to 20/80%
= 40% - 50% reduction

To translate this into percentage savings of labor costs, going from 80% manual to 20% manual cuts out three quarters of the manually processed claims. Considering that the remaining manual claims take longer than the average manual claim that has been eliminated, there is a potential savings of 40% to 50% of your company's claims processing center cost today. (Note that this assumes that claims payments are processed by a separate accounting function, not as part of the center's activities, so the center's only job is claims processing.)

You can make use of the *Claims Processing Cost Worksheet* on page 17 to develop cost estimates for the warranty claims process at your company.

Invalid Claim Detection The other potential savings with claims processing is the improved detection of invalid claims. Given that in general 10% - 15% of claims are invalid, the first piece of information to obtain is the percentage for your company. This may require a manual calculation if there is no system to supply number of claims denied divided by claims submitted. You may also consider cross-checking the number by looking at total dollar value of claims denied divided by total dollar value of claims submitted.

% Denied Claims:

5% today, potential for 10%

Savings = 5% x total of claims paid

If the percentage of claims denied is low, then consider an estimate for savings on an increased rate of rejection. For example, if you deny only 5% of claims, it would be reasonable that you could deny 10%, or 5% more, with a processing system that incorporates more of the rules used to accept or deny a claim.

This brings up an important issue for consideration. Claims denied are often processed manually, therefore they increase the manual claims processing costs. It is worth the exercise to measure the savings from increased denial of claims against the savings from automating all claims processing and accepting all claims.

"Best practices in warranty management reduce the process cost, emphasize supplier recovery, and create new warranty products, thereby returning millions of dollars to the business."

– Marc McCluskey,

*AMR Research, Looking for Cash:
Warranty Management is a Good
Place to Start. August 28, 2003*

Return Parts (RMAs) – Potential Savings

RMA processing may be the most difficult area to determine potential cost savings. There are a number of variables involved, such as how many RMAs your company processes, how often an RMA is not requested, what percentage of RMAs are never received, whether RMA parts qualify for supplier recovery, and whether RMA parts are refurbished and returned to inventory. This section will provide some guidance in determining cost and calculating savings.

Estimating potential savings for RMAs depends upon determining what percentage of the time your company fails to request an RMA. If your company has a system, this type of information will be available, although it may require some analysis to derive it. If your RMA operations are manual, you will need to rely on the estimates and guesstimates of experienced members of the RMA team.

Labor Cost Savings The first area for costs savings is in labor time spent tracking and enforcing the creation of RMAs for applicable repairs, receipt of parts, recovery from suppliers, and refurbishing and return to inventory. The time required to do this, either manually or using a mainframe system that doesn't integrate with the service centers, will vary depending upon the number of different service centers involved, as well as the number of suppliers or vendors that are brought into the process. This effort could easily require 10% to 20% of

total time spent on RMAs. Therefore potential savings of half of that time (a conservative estimate) resulting from automating and integrating the system across the entire warranty chain translate to 5% to 10% of RMA labor costs.

RMA Tracking (and Enforcement) Labor Cost Savings:

5% - 10%

of total RMA labor costs

Supplier Recovery A second area for potential savings is increased cost recovery from suppliers through two improvements to your RMA process:

- Higher return rates (fewer omitted RMA requests and shipments) allows your company to send more parts to the supplier for cost recovery, if sending the part is a condition for reimbursement.
- Higher return rates allow your company to uncover more cases where a malfunction is due to a supplier part, and therefore the claim payment can be recovered.

To estimate potential savings, you need to determine a percentage for omitted RMA requests, add a percentage for omitted shipments, then multiply the sum by a percentage of inspected RMAs that result in supplier recovery, and finally multiply that percentage by a total recovered from suppliers.

The numbers provided by way of example provide potential savings for every \$1 million recovered from suppliers by your RMA operations. If your recovery numbers are in the millions, savings can be substantial.

RMA Supplier Recovery:

(sample)

Omitted RMAs	20%
+ Omitted Shipments	10%
= Total Omitted RMAs	30%
x % RMAs Recovered	30%
= % New Recoverable	9%
x \$ RMAs Recovered	\$1M
= Additional Recoverable	\$90K

Refurbished Inventory Similar to supplier recovery savings, increasing the percentage of parts returned and refurbished cuts your inventory costs by allowing your company to supply more inventory at a cost that is cheaper than purchasing new. After determining a percentage of parts that are refurbished and returned to inventory, and calculating the cost savings for all refurbished parts, you can derive a potential savings amount for every \$1 million of cost savings from refurbishing.

Refurbished Inventory:

(sample)

Omitted RMAs	20%
+ Omitted Shipments	10%
= Total Omitted RMAs	30%
x % RMAs Refurbished	30%
= % New Refurbishable	9%
x \$ Inventory Cost Savings	\$1M
= Additional Refurbishable	\$90K

Unnecessary Shipping Costs If your company has a rule that a part must be shipped back to you, your company continues to pay for shipments of broken parts after the cause has been identified and can be fixed on the production line. By estimating the typical amount of time at the beginning of the product life-cycle to identify the major causes of RMAs, you can determine at what point further shipments become a cost that can be eliminated. For example, if 15% of a part comes back for warranty claims, by the time the first 5% have come back, the major problems have been identified. Shipment of the remaining 10%, or two-thirds of total RMA shipping costs, could be eliminated.

Supplier Recovery - Potential Savings

If your company’s product involves extensive outsourcing of assemblies and parts to suppliers—in terms of either number of parts or dollar value—better recovery of money from suppliers can result in a substantial savings for your organization. If for every \$1 billion in revenues you have typical warranty costs of \$17 million, and you can reduce this cost 10% by better collection from suppliers, you save \$1.7 million in the first year alone.

Supplier recovery has the greatest potential for immediate cost savings, along with claims processing, because of the claims payments you can potentially pass along to vendors.

By implementing a system that automatically flags amounts for supplier recovery based on the repair work performed, you ensure that your company collects from suppliers and vendors for all applicable claims.

Quality Improvement - Potential Savings

Using your warranty operations to feed detailed, timely information to the quality improvement process represents the area of greatest savings in warranty costs long term. Quality initiatives have been successful in making improvements that involve reducing problems coming off the manufacturing line before product leaves the factory. However, typical warranty operations—which involve product only after it has left the factory and is in the hands of the customer—have involved insufficient collection of repair and malfunction information at the service center, claims processing time-frames of 30 to 90 days, and information that is not accessible to the quality team. This has meant that warranty operations have remained a gray area for quality improvement.

It is not unreasonable to estimate that collection of complete problem, cause, and repair information, speedy claims processing, and warranty analysis available to the quality team in real time could cut warranty costs 50% over the long term. This would be done through a combination of fixes to design and production, and efforts to push for fixes from suppliers.

A 50% savings equates to an average of \$8.5 million yearly savings for every \$1 billion in revenues.

Savings initiatives related to quality improvement face the usual dilemma of other quality initiatives, namely the struggle to quantify expected savings and place a dollar value on improvements in customer loyalty.

Improved Supplier Recovery

- \$1B annual revenues
- \$17M warranty costs
- Recover additional 10% of costs:
- \$1.7M savings

Warranty Reserves - Potential Savings

Savings related to the warranty reserve would come from more accurate reserve forecasting, made possible by complete and timely warranty information and trending reports. It is hoped that a more accurate warranty reserve will mean a lower reserve because Finance has enough information to be confident that enough money has been set aside.

Savings also come from other initiatives—claims processing, supplier recovery, RMA tracking, quality improvements—that cut warranty costs.

The appeal of lowering the warranty reserve is that every dollar saved is a dollar that goes to (pretax) profits. Therefore, the dollar amount, while small in terms of total revenues, has a significant impact.

An initiative to analyze the raw data in the warranty system using updated and advanced reporting tools would provide information that is critical to forecasting reserve needs, such as:

- Trends in costs over the product life cycle.
- Life-cycle trends by product category.
- Actual costs for each individual product.
- Comparison of past warranty actuals against reserves.

Dealers and Repair Centers - Potential Savings

The significance of savings at dealers, repair centers, retail outlets, and distributors depends upon how many different organizations and locations your company works with.

Potential savings in this area is difficult to measure, but takes the form of either labor savings at the point of service due to faster data entry, or labor savings at the claims processing center due to not having to re-key information.

By providing a system at the repair center that allows technicians and service reps to quickly record repair work from a list of standard tasks, and select parts from an online catalog, you create labor cost savings that are multiplied by the number of separate locations and the number of individuals working on the system. To estimate savings, you will need to know the number of locations and individuals.

A very conservative estimate would be that quicker data entry saves 1 hour of an individual's time each week (2.5% of a 40 hour work week). Multiply 48 hours over the year per person times the number of people who use the system, and you have an estimate of annual labor savings.

Note that although providing data entry at the point of service goes hand in hand with capturing complete information, the latter benefit is associated with quality troubleshooting and therefore not measured here.

Total Savings Add Up

Your company may not benefit from savings in all the areas discussed in this white paper, and the relative importance of savings in each area varies from company to company. However it becomes clear that with a concerted and committed effort to address multiple areas of potential savings described here, results add up to significant savings on warranty costs. It is not unreasonable to aim for a 50% reduction in warranty costs overall through a combination of:

- Streamlined claims
- Automated acceptance or denial
- Better supplier recovery
- Better RMA handling
- Faster quality improvements
- More accurate reserves
- Integration with dealers and service centers

When General Motors Corp. announced its financial results for the second quarter of 2003, it stated that the company was profitable because it was able to reduce its warranty reserves—due to improvements in quality.

Without the \$199 million additional money that hit the bottom line, the company would have announced a quarterly loss. The reduction in the reserve increased Earnings Per Share by 36 cents for the quarter.

The next section provides some ideas for specific cost saving initiatives and where the savings apply.

Cost Saving Initiatives

This section lists common initiatives to reduce costs that your company can undertake. Initiatives are briefly described in terms of what is involved and which costs are targeted.

If your company has a manual warranty system today, a first initiative could be to establish processes, standard forms and rules for being more efficient and effective at claims processing, supplier recovery, and RMA processing. The next step would be to implement software applications to streamline and automate these processes.

If your company currently has warranty software, chances are that it is running on an outdated and inflexible technology such as a mainframe. Usually companies in this situation rely on an established set of processes and rules. However, moving to a warranty application that works on PCs and other common computer hardware in use today would have great benefits in terms of lowered maintenance costs and the ability to provide users outside your company, such as suppliers, distributors, and dealers, with ready access to the system to submit claims, check their status, and respond to your claims to suppliers.

The table below lists cost saving initiatives to consider.

Initiative	Methods	Targeted Cost
Automated claims entry	Process (forms, training), technology (application software)	Dealer and Repair Center, Claims Processing, Supplier Recovery, RMAs, Quality
Automated claims approval	Process (decision trees, training), technology (rules software)	Claims Processing, Quality
Integrated warranty chain processing	Process (training), technology (email, telephone, software)	Each member of the chain, Supplier Recovery, RMAs
Claims process analysis	Manual, technology (analytics and rules software)	Claims Processing, Supplier Recovery, RMAs, Quality
Problem analysis	Manual, technology (analytics software)	Claims Processing, Supplier Recovery, RMAs, Quality, Reserves
Supplier recovery tracking	Manual (forms, training), technology (integrated software)	Supplier Recovery, Quality, Reserves
RMA tracking	Manual (forms, training), technology (integrated software)	RMAs, Quality

Cost Saving Tools

This section describes software and other tools your company can use to save on warranty costs. These tools are presented in the following sections:

- Processes
- Forms
- Claims Processing Software
- Reporting and Analytics
- Warranty Chain Integration
- Quality Initiatives
- Supplier Initiatives
- Other Resources
- Offerings from Entigo

Processes

It is critical to define processes that are documented and explained to all those involved with warranty processing. Doing so can make operations more efficient and ensure that issues such as RMA returns and supplier recovery are dealt with consistently.

Processes can be developed whether or not you use software, and they are helpful, sometimes even critical, to the success of any software your company implements. A division of a major computer company managed to cut 20% from their warranty costs in the first year by tightening processes and controls and improving billing follow through.

Your company's effort to improve processes can be significantly enhanced through the use of outside consulting services that focus on warranty processes.

Forms

The simplest tool to streamline warranty operations and to ensure requested parts are returned is paper forms. If you do not currently have warranty processing software, standardized forms that support well defined processes can cut claims processing costs, ensure more parts are returned, and improve supplier recovery rates.

Claims Processing Software

Claims processing software serves to cut labor and catalog costs by automating claims entry and the process of moving claims through review and acceptance or denial. A software application with more complete functionality also automates the request of RMA parts and supplier recovery. Claims processing software will help make your company's day-to-day warranty operations more efficient.

Reporting and Analytics

Reporting and analytics is accomplished through the integration of warranty and other data into reporting software. It is important, if you want to obtain detailed information specifically on warranty costs, to have claims processing software that collects detailed repair and claims information to include with information from product design and production systems.

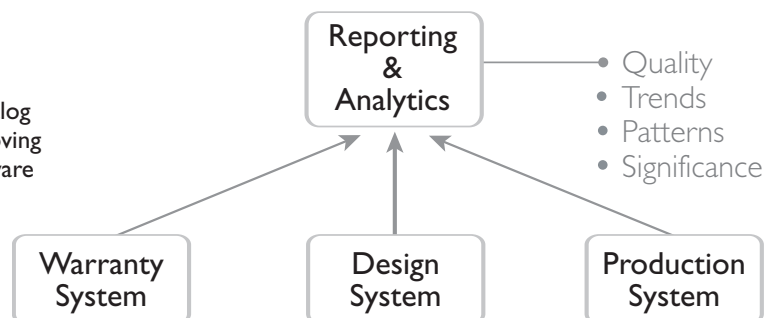
Claims processing software cuts costs related to labor, supplies, and omitted RMAs and supplier recovery—all after a product malfunctions. In contrast, reporting and analytics software serves to spot trends and diagnose causes in order to change product design and production, cutting warranty costs through prevention—stopping problems before they occur.

Obtaining all the cost benefits from reporting and analytics software requires pooling and merging information from at least three systems:

- Warranty Processing
- Product Design
- Production/Manufacturing/ERP

Entigo Catalyst™ Consulting Service

Entigo offers Entigo Catalyst, a consulting service that analyzes and assesses your warranty operations and requirements. Entigo Catalyst identifies cost savings and service improvement initiatives in detail, and presents the findings and recommendations to the management team. The service builds a financial business case for improvements to your warranty system. Entigo Catalyst is available both as a part of the purchase of Entigo software and independent of the Entigo Warranty application. www.entigo.com.



Warranty Chain Integration

Warranty chain integration aims to cut inefficiencies involved in communicating claims information between all different partners in the warranty chain. For an explanation of the warranty chain, refer to page 2.

Warranty chain integration can be done through manual initiatives such as processes and forms and through software. Software for warranty chain integration requires a system that can be easily used by many individuals in different locations and in different companies. Software that is web-enabled lends itself to easy implementation across the warranty chain. Mainframe software, which is common for legacy warranty processing applications, is difficult or impossible to extend beyond the walls of your company.

Warranty chain integration requires the involvement of business and technical staff not only from your own company, but from suppliers, distributors, dealers, and repair centers.

Quality Initiatives

Quality initiatives may or may not involve the use of software, though reporting and analytics enables better troubleshooting and problem diagnosis. Diagnosis of problems and their cause also requires that sufficient repair and claim information is captured by the repair center and available to your company. Quality improvement, as a topic unto itself, is covered in detail in many books, magazines, and web sites.

Quality initiatives usually rely extensively on the ERP or manufacturing system at your company. One challenge with warranty claims, which are originated outside the ERP system, has always been obtaining data that is complete and detailed enough to allow for diagnosis and corrections to the design. This is where a claims processing system, designed to capture such data, which can be easily integrated with the ERP system, provides a valuable boost to quality initiatives to diagnose warranty problems.

Supplier Initiatives

Your company may be lucky enough to benefit from initiatives launched by your suppliers to cut warranty costs by improving claims processing and addressing quality issues. Today, as they begin to realize the magnitude of their potential liabilities in terms of money and customer dissatisfaction, many suppliers are taking the initiative to coordinate claims processing and reduce warranty costs.

After you measure the amount of warranty money recovered from suppliers, your company can determine whether it's in a position to put pressure on specific suppliers to integrate their warranty processing with yours, and to improve quality.

Recording detailed problem, cause, and repair information of warranty processes from end customers to repair centers, to manufacturers, and then passing this information on to suppliers is critical if your suppliers are to be able to diagnose problems and fix them for upcoming production runs.

Other Resources

- WarrantyWeek is an online magazine launched in early 2003 to focus exclusively on warranty issues. This appears to be the only periodical of its kind. Just as warranty authority and responsibility tends to be scatter among production, quality, claims processing, and customer service, so too is warranty information scattered across publications that focus on different industries or functions such as service or production. WarrantyWeek's coverage of the warranty area is resulting in the discovery of industry benchmarks and best practices. Subscription is free at www.WarrantyWeek.com.
- FASB Interpretation No. 45. The Financial Accounting Standards Board (FASB) published this document, entitled Guarantor's Accounting and Disclosure Requirements for Guarantees, Including Indirect Guarantees of Indebtedness of Others, in November 2002. It elaborates on the existing disclosure requirements for most guarantees and can be obtained from FASB (www.fasb.org).

Offerings by Entigo

- Entigo Corporation (www.entigo.com) makes Entigo Warranty, a web-enabled enterprise software application to process warranty registrations, service, claims, RMAs, and recovery of claims money from vendors.
- Entigo produces an ROI calculator that allows companies to calculate an ROI on their potential investment in a warranty application, detailing warranty costs savings measured against cost for the application.
The calculator includes a fine grained breakdown of labor costs associated with warranty processing, taking into account different tasks, individuals, salaries, and overhead multipliers. It comes with standard salary and cost figures for reference.
- Entigo also delivers its Entigo Catalyst service designed to work with all applicable departments within your company to analyze and assess your warranty operations and requirements. This consulting project identifies cost savings and service improvement initiatives in detail, and presents the findings and recommendations to the management team. It builds a financial business case for improvements to your warranty system. Entigo Catalyst is available both as a part of the purchase of Entigo software or independent of the Entigo Warranty application.

Claims Processing Cost Worksheet

Use this worksheet to estimate the cost of processing typical claims at your company.

Step in the warranty process	Position	Annual Salary	Overhead Coefficient*	Cost per Minute **	Average Time of Step (minutes)	% This Step Applies ***	Average Cost of Step

* Overhead Coefficient is the amount to multiply salary by in order to obtain the fully loaded cost of an employee.

** A simple calculation for Cost per Minute is Annual Salary multiplied by the Overhead Coefficient, then divided by 120,000, or the number of minutes in 50 weeks of 40 hours.

*** % This Step Applies is 100% if the step is performed for all claims. Otherwise, estimate a percentage of claims where the step is performed.

Conclusion

Your company can realize significant savings in warranty costs—even cutting costs in half—by doing the following:

- Thoroughly identify all components of warranty costs at your company.
- Estimate potential cost savings for each component.
- Evaluate cost saving tools such as forms, processes, training, and software.
- Create a road map of initiatives to cut warranty costs.

The overall cost cutting effort can gain momentum over time if you plan the initiatives so that some of the money saved in one initiative can be used to increase resources for later initiatives.

It can be difficult to go through the exercise of estimating costs savings. However, potential savings are substantial enough to deliver a good return on your investment in this exercise.

Entigo Corporation can provide assistance with estimating cost, identifying improvements, and calculating an ROI for your warranty initiatives, through such tools as the ROI Calculator and the Entigo Catalyst consulting service, as well as Entigo Warranty software that automates and streamlines warranty claims processing across the entire warranty chain.

Customer Loyalty: the Ultimate Cost Cutter?

One important note: This white paper treats savings on warranty costs as the justification for improving your company's warranty situation. However, be aware that another important goal of improving the warranty situation is to build customer loyalty through fewer repairs, recalls, and returns. Ultimately, this results in more repeat sales, in other words more revenue at a lower cost of sale, and therefore improved profitability.

About Entigo

Entigo is the world's leading provider of warranty chain management solutions. With Entigo Warranty, businesses save millions by efficiently and accurately processing claims, increasing supplier cost recovery, and accelerating problem identification and resolution.

Entigo is headquartered in Malvern, PA and can be contacted on the web at www.entigo.com or via phone at (610) 232-2900.

