Using reliability and warranty analytics to deliver transformational business impact

A demanding and dynamic business environment

Rapid technology changes have increased asset acquisition costs for organizations. For original equipment manufacturers and operators of their equipment, the key to cost-effective and performance-effective industrial
asset management (IAM) is to transform equipment maintenance operations. Well-run, technologically sophisticated Procurement and Service departments determine the best suppliers and assess complex warranty policies. Up to 30% of incremental shareholder value can be achieved through an optimized IAM program.

A key component of such programs is the ability to scientifically analyze reliability and warranty contracts. Genpact’s global team of IAM experts is the ideal partner for companies that want to streamline and improve equipment maintenance operations through asset reliability and warranty analytics. Partnering with Genpact’s experts in Lean Six Sigma and analytics offers a collaborative, technology-based, data-driven process that builds new efficiency and profit opportunity into equipment maintenance operations by enhancing reliability and warranty analytics.

Challenges of staying competitive

Equipment maintenance companies face urgent challenges at every stage of the value and supply chains. Some of the inherent challenges in each stage include:

**Asset acquisition**—Rapidly changing technology means the cost of procuring the most cost-effective equipment is increasing rapidly as well. New technology can also require more complex warranty and extended-warranty policies and better analytics to assess what is needed. Procurement and service organizations will be required to distinguish appropriate warranty costs from those unnecessary for a company that services its equipment well and gets optimal operating life from its assets.

**Maintenance scheduling**—Inefficient scheduling often leads to unexpected and profit-draining equipment downtime and decreases the operating life of the asset. Additionally, poor scheduling leads to internal or customer dissatisfaction and higher maintenance costs. Service departments must have timely scheduling and optimal control over parts inventory to eliminate unanticipated equipment downtime and unnecessary service expenses.

**Warranty and recovery**—Companies need timely asset performance data in order to assess parts and equipment inventory requirements and optimal working capital levels. Up-to-date equipment monitoring and analytics for performance and asset degradation provide the hard data necessary for cost-effective warranty purchasing, management, and claims recovery. By effectively assessing and managing warranties, a company can find the best suppliers.

**The Genpact approach: A new methodology for managing equipment reliability and warranty**

An analytics-based system that accurately assesses equipment reliability and warranty provisions and creates an optimal service environment requires the latest software, best-in-class equipment
monitoring, and thoroughly trained and qualified data managers. Cost-effective service and maintenance depend on predictive and prescriptive equipment monitoring and data management plus the ability of service personnel to “fix it the first time out.”

After examining various industry scenarios, Genpact understood there was no formal or standard method for determining the value of extended warranty policies and protection. We also recognized data-maturity challenges are inherent across various pieces of equipment within the enterprise. Where there was mature data (a.k.a., data where much of the population has lived through the warranty period), we developed a method for calculating the cost per unit (CPU) over the warranty term. Where data was immature (i.e., much of the asset population usually has not seen its life through the warranty period), we accurately estimated the CPU by building reliability models that forecast equipment failures during the warranty period.

With mature data, the process for calculating the CPU generally consists of cleaning and consolidating data, followed by analyzing and comparing the extended-warranty CPU. With immature, incomplete, or inadequate data, the assessment is different and requires additional steps. The first two steps are the same: Calculating the asset failure costs from the information available and determining the number of vehicles or assets serviced monthly. However, from there, probabilities are calculated using reliability models.

<table>
<thead>
<tr>
<th>Mature data</th>
<th>Immature data</th>
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<tbody>
<tr>
<td>• Examine the maintenance data (failure data) in detail to clean any bad records and assess the cost information to calculate failure costs</td>
<td>• Analyze the top failure modes by count and cost</td>
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<tr>
<td>• Consolidate data across different databases to determine the number of vehicles or equipment put into service each month</td>
<td>• Create reliability models for each top failure mode, and a different model for the other failure modes</td>
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<td>• Analyze the gross costs for the assets by model year and years in service</td>
<td>• Forecast the failure rates from the reliability models</td>
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<tr>
<td>• Calculate the actual CPU and compare it with the extended-warranty purchase CPU</td>
<td>• Analyze repair costs to develop a central tendency value for repair costs</td>
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<td></td>
<td>• Estimate the CPU based on failure rates and repair costs</td>
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<td>• Compare the estimated CPU with the extended-warranty coverage purchase cost</td>
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Genpact equipment maintenance analytics service offerings

Genpact offers a comprehensive package of assessment services and tools, and uses them to develop and implement optimized equipment maintenance programs for clients. These advanced, complementary, and integrated analytics are designed to create a holistic view of maintenance and warranty management based on hard data and measurable objectives and results. The portfolio is essential for creating integrated, cost-effective, and optimized field service and warranty evaluation platforms. With this portfolio, an enterprise can deploy up-to-date, best-in-class technology and employ the sophisticated data managers necessary to build the most cost-effective, equipment service life-cycle management operation possible.

Business impact generated

Genpact has been at the forefront of delivering business impact for industrial companies across the world by using a combination of smarter processes, analytics, and technology. Our reliability and warranty analytics methodology is highly replicable across industries that have assets needing warranty and maintenance, such as Home and Electrical Appliances, Computers, Office Equipment, Machinery, etc.

The case studies demonstrate how data-driven analytics can generate significant impact for the client.

Client: A global oil and gas major, a leader in providing drilling and production applications

Business need addressed: Current blowout preventer (BOP) redesign for high-speed, reliable performance in an offshore environment

Genpact approach: Created robust controls programming; developed a complex algorithm that creates automatic rules for key performance indicators; configured data logging on a machine-to-machine basis and deployed network protocols for better peer-to-peer communication; automated time series data archives to eliminate manual effort and simplification of the touchscreen user interface

Genpact impact: Realized a 5% improvement in efficiency for 2000-plus global installed bases and 400-plus annual deployments; improved reliability in BOP designs for offshore drilling operations and better operator experience

Client: A global oil and gas major, a leader in providing drilling and production applications

Business need addressed: To reduce maintenance costs by reducing the spend on the purchase of extended warranty coverage for new vehicles

Genpact approach: Used a combination of CPU analysis for mature data and probability-based predictions for immature data, resulting in near accurate analysis of requirement of warranty coverage

Genpact impact: US 12 million in one year ($7 million as refund on already purchased coverage – for cancellation – and another $5 million by avoiding purchase of coverage)

Client: A regional division manufacturer of global aircraft engines and systems with an extensive global service network

Business need addressed: Improve visibility in part failures to help reduce maintenance costs and parts inventory and increase productivity at manufacturing shops

Genpact approach: Performed root-cause analysis to understand the reasons and extent of part failures and make better repair-vs.-replace decisions based on a detailed analysis of the reliability of new parts vs. repaired parts; failure probability calculation across the contract term using the Weibull distribution curve; and comparison of maintenance and repair over the contract term vs. the cost of replacement

Genpact impact: Annual savings through inventory reduction, productivity improvement, and better cost visibility
About Genpact

Genpact Limited (NYSE: G) is a global leader in transforming and running business processes and operations. We help clients become more competitive by making their enterprises more intelligent: more adaptive, innovative, globally effective and connected. Genpact stands for Generating Impact for hundreds of clients including over 100 of the Fortune Global 500. We offer an unbiased combination of smarter processes, analytics and technology through our 64,000+ employees in 24 countries, with key management based in New York City. Behind Genpact’s passion for process and operational excellence is the Lean and Six Sigma heritage of a former General Electric division that has served GE businesses for 15+ years.

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