

# AI-POWERED WARRANTY MANAGEMENT

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WHITEPAPER

AI is moving much faster than anticipated. We come across its usage and benefits in our day-to-day life. AI and its related subsystems are helping to make business decisions faster and better. This paper explores the practical realities of artificial intelligence (AI) in warranty management and measurable benefit which helps business leaders to adopt in their businesses today.

## Introduction

It is estimated that automotive manufacturers spend over \$70 billion on warranty claims each year. It is estimated at \$800/vehicle/year as warranty reserve which is on the higher side<sup>1</sup>. Global manufacturers are incurring huge expenses in warranty spend and it is estimated to cross more than 3% of the total sales revenue of a given period.

The main components of warranty expenses are due to repetitive failure in the performance of parts or quality-related issues. The typical recovery of warranty costs from suppliers is 16%-18% but many OEMs are way below this benchmark.

Communicating warranty information across the organization is more critical than ever and getting a single view and analysis of warranty data is very critical to business success. Optimizing the warranty cost is the primary focus. Warranty management systems with data driven, future proof, intelligent decision making are looked upon as the need of the hour

The age-old, rules-driven system often stays the same for extended periods and doesn't evolve at the same pace as fraud methods evolve. Over a period, the dealers/agents will learn which tricks are rejected, which are approved, and how to bypass the hard-coded rules.

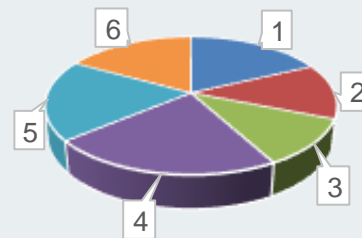
Warranty data insights can help to discover and deliver benefits beyond the warranty function. It can help in the improvement or redesign of existing operations, customer experiences, actual products, warranty processes, better supplier and dealer relations, and the workforce methods that produce them. More accurate demand forecasting: Adaptive planning and scheduling systems, as well as simulation models are key imperatives to building a responsive and agile supply chain. Using AI and machine learning, systems can test hundreds of mathematical models of production and outcome possibilities and be more precise in their analysis while adapting to new information such as new product introductions, supply chain disruptions or sudden changes in demand.

Machine learning (ML) automates the development of analytic models that can learn and make

recommendations/predictions on data. It is the fastest growing discipline in data science, and statistics but the entry barrier has been high, not just in cost, but also in the need for specialized talent to benefit from models

## What makes up Warranty Spend?

The following components constitute of top items in warranty spend by manufacturers/OEMs:



- Supplier Recovery Costs (1)
- Operational Costs (2)
- Fraudulent Claims (3)
- Poor Traceability (4)
- Production Quality and Field Quality (5&6)

## AI in Warranty Management

Analytics, insights, and patterns help to turn repair data into cost savings. Advances in technology, access to vast amounts of data fuels claims for warranty analytics and warranty management solutions powered by AI. The next horizon of quality control and assurance automation to help optimize warranty management. The OEMs are employing many advanced technology solutions like AI, machine learning, cognitive process automation, enhanced ruleset, warranty analytics, connected vehicle data to get insights, automated claim process, and eliminate fraudulent claims.

In many cases, it's necessary to affect the unfinished or subjective information supported

claims of vehicles owners. Reacting at the speed of business, the velocity of commerce is rapidly increasing and will continue to do so in the foreseeable future. It is very important to have a fraud detection solution early on in the process. It is the best option and easier to withhold payment till the issue is resolved than to pay and try to retrieve the payment due to the fraud that has been identified later in the claim process and payment.

In another scenario, by having predictive models for warrantable components, Enterprises can save millions of dollars in both repair costs, repeated repairs, and customer retention because issues are predicted, proactively addressed before they become significant problems, and better predict and manage the potential recall.

Warranty data is continuously collected, tracked, and analyzed with a greater appreciation which helps in customer satisfaction, product redesign, improving product quality improvement, and reliability to minimize warranty claims. Machine learning models can be utilized to analyze, identify, and accelerate in problem solving with right root-cause analysis, particularly for uncommon or intermittent quality issues. In today's world, due to customer preferences and choices offered to attract customers and differentiate in the competitive world, many customizations and configurations are causing products to fail in unique ways since products have more electronics, tailor-made components, software, and complex system integrations. Due to the complexity of the components and configurations, expertise from a wider range of disciplines is required to diagnose and resolve quality issues related to various failures. Increased customer preferences, customized builds, integration of software and hardware components and configurations increase product complexity which results in higher quality costs and skilled resource needs.

Enterprises are forced to ameliorate the delicacy and speed of their opinions on fraudulent pitfalls. AI-powered warranty solutions should provide enterprises with innovative ways to reduce warranty cost and waste, potential fraudulent claims, and streamline claim processes thereby reducing overall warranty spend.

Business rules can identify some errors in claims entry but are not effective in mining the warranty data to analyze, recognize patterns and detect anomalies that indicate fraud, repeat repair, high-cost variance claims. Manufacturers need an easy-to-use, flexible, and cost-effective warranty management solution powered by AI models which integrate easily with legacy systems.

## How can AI help?

Develop AI/ML models to analyze, identify trends (such as similar issues), enabling teams to identify issues many months before they turn into warrantable claims and affect customers. Over time, suppliers can be ranked based on their parts quality, failure rate, and recovery rate using AI/ML models. Enterprises can be prepared to run recovery sprints at regular intervals when negotiating about how to address supplier-caused issues. By sharing responsibility for claims and adding new terms and conditions to supplier contracts with the right incentives for quality items, supplier recovery can be improved. Advanced analysis of vast amount of warranty claim data can form the basis for the estimation, prediction, and comparison of claims across different product groups or across time horizons. This can lead to development of predictive models on part failure, warranty claims forecast, and high-cost variance analysis on claims.

AI-powered warranty analytics solutions can improve forecasts, optimize approval processes, maintain optimal inventory, predict failures, proactive monitoring, use models for understanding trends, identify fraudulent claims, recover warranty costs, and so on.

A rules-based approach often stays the same for extended periods and doesn't evolve at the same pace as fraud methods evolve. As time goes by, understand how claims are getting processed, the service agents are smart enough to learn which tricks are rejected, which are approved, and how to bypass the rules. Many enterprises are struggling with the right number of rules, getting either too many false positives or too many false negatives (e.g. fraud goes undetected). Enterprises can use warranty data to redefine, optimize claims processes, reduce manual effort, perform text analytics for any potential fraud, claim cost variance, and forecast failure and parts usage.

Advanced analytics can help enterprises benefits from asset usage, service, parts performance, and parts failure data to develop stronger bonds with customers by ensuring dealers have parts available for customer repairs when they visit the dealer. Through predictive failures and demand forecasting

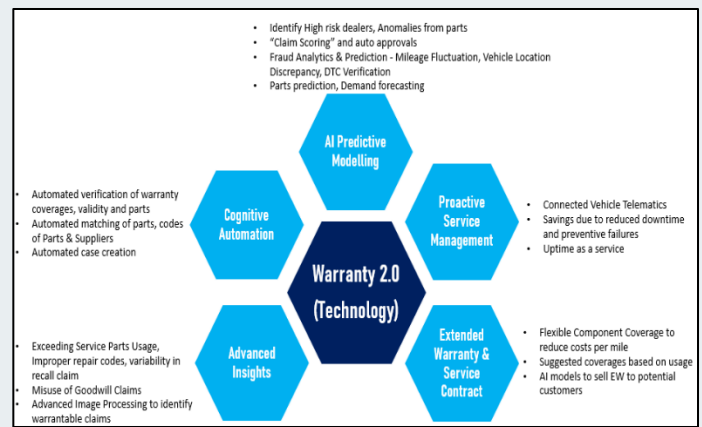
models, making sure the parts are available when needed at the right place. If not managed well, in the long term, poor warranty management can have a negative impact on a company and reputation.

Automakers are facing a huge shift since owning a car is no longer a must in the current millennial age. To be competitive in the millennial's age, enterprises must digital and data-driven personalized experiences. Reducing the multiple handoffs, disputes, and resolution steps inherent in claims results in a better end-to-end experience and customer loyalty.

Utilizing state of the art spend analytics solutions backed by AIML for better negotiation in volumetric business areas, consolidating the number of suppliers a company uses can often get in the way of collecting important information about what the suppliers can provide: quantities of different components, the types of materials in those components, better pricing, and so on. After data is collected from various sources, an AI algorithm can be developed and send an alert if there is any discrepancy or outlier. A vast amount of data generated from warranty claims, parts failure, labor hours, field data, parts usage, and other supplementary data can be useful information for product design, reengineering, product quality, reliability, and improved customer experience.

## Challenges AI can help address

- Improve operational efficiency by automated approval and automatically identifying a claim status and continuously analyzing the rejected claims to improve the automated approval process
- Clustering suppliers and parts on multiple dimensions such as costs, failure rates, failure types, days to failure, etc. to intelligently identify the efficiency bottlenecks
- Collect and process the requisite data from various sources to perform an accurate Root Cause Analysis (RCA) and resolve a warranty issue satisfactorily
- Capture information, recognize patterns at the parts and supplier sub-assembly level to identify and ship the correct replacement parts to the service center at the earliest
- Get alerts to detect emerging issues on multiple KPIs before they have a significant impact on performance



## AI Powered Solutions

Predictive analytics can enable businesses to realize multiple warranty data related use cases, ranging from optimized R&D and production over decreased warranty costs to optimized fleet management with better customer satisfaction.

With advanced analytics, you can identify individual claims, which have a high likelihood of being incorrect and route through the human route. With advances in analytics and AI models, you can also flag service agents or dealers who have a high number of these suspect claims, and therefore are candidates for further investigation.

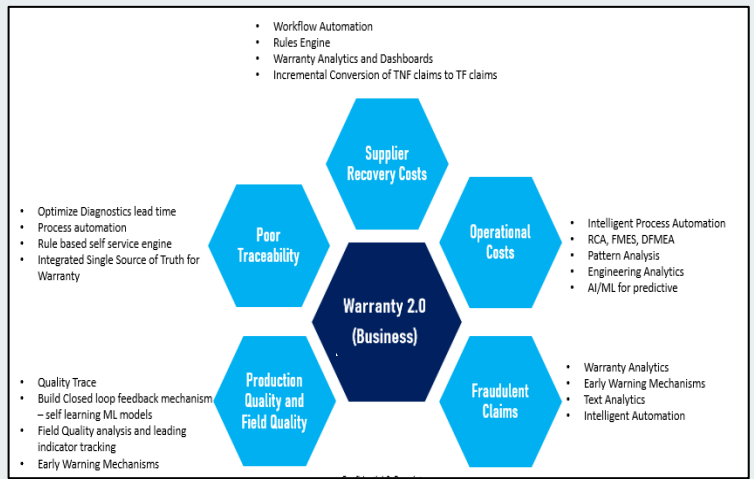
Machine learning will have a high impact on warranty cost reduction with predictive analytics and maintenance. ML models can continuously analyze and process new data and then autonomously update its models to reflect the latest trends and improve the model accuracy.

Parts demand forecasting allows the manufacturer to make sure dealers have in-demand parts available for repairs, making it more likely customers have an excellent experience and maintain optimal inventory at manufacturing plants.

AI-powered warranty management solutions offer better cost savings, better supplier recovery, reduced no trouble found (NTF), parts failure prediction, demand forecasting and capital reserves planning, performance metrics and standards, more detailed insights, performance efficiency, and greater control across your business.

For example, ML and robotic process automation (RPA) can standardize the invoice process automation by extracting and entering the details directly into internal systems for approval.

AI powered solutions can be categorized by the various business processes and address warranty challenges with advances in technology:



## AI Powered Solution Benefits



2-5% reduced warranty costs



7-10 % increase in supplier recovery



5-10% improvement in first time fix rate



40-60 % reduction in claim process cycle time



Better visibility of in Warranty claims, cost reserves and prediction



30% reduction in fraudulent claims



Faster processing and 360-degree view of claims and customer data insights



5-10% improved dealer performance and tracking



Improved quality through enhanced product and claim data availability



Improvement in service efficiency



10-20% increase in services revenue and claim data availability



Parts inventory optimization and demand forecasting

## Conclusion

Warranty Analytics 2.0 is an integration of sales data, warranty data, reserves with customer, product, sales, supplier, service provider, and geographical information, so companies can accelerate detection of failures and reduce time to correction. Prediction based early warning of issues and timely inputs for the vehicle design and engineering is key for quality improvement and reduction of warranty cost. Many enterprises are preferring to improve warranty management-related planning, visibility through data insights, forecasting activities, optimizing warranty costs to have a big impact on the bottom-line and brand image through greater utilization of warranty data and insights. With advances in technology, connected data, simulation, advanced analytics, and AI, enterprises can address the causes of warranty claims, rather than the symptoms of failures which results in warranty cost reduction to a great extent.

## Ravi Pandikunta

With over two plus decades of rich experience in helping clients visualize their digital future, translating business needs, desired outcomes into technology strategies, and digital enterprise architecture plan to keep pace in digital age thus controlling costs and mitigating business risks, Ravi has a proven track record in digital enterprise architecture, consulting assignments resulting in business transformation, innovation, and uncovering cost savings using solutions based on cloud, mobile, social, IoT, cognitive, automation, machine learning, and big data analytics across domains. Proficient in creating insights and value from all the data which a modern enterprise generates.

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