



# HOW A DATA-DRIVEN STRATEGY TRANSFORMS THE WARRANTY PROCESS

Warranty analytics is a pivotal capability in today's competitive market. Leveraging next-gen data tools enables manufacturers to improve existing products, develop more reliable new products, and increase profitability. More broadly, data-driven strategies and tools reduce costs, improve the customer experience and brand reputation, and help organizations comply with regulatory requirements.

In many industries – including automotive, white goods, and consumer electronics – the large variety and quantity of claims makes traditional business intelligence-based analysis tools slow and unwieldy due to their lack of specialized data transformation and machine learning capabilities. Altair's data-driven warranty analytics technologies offer a better alternative.

## Benefits of Warranty Analytics

The ability to access and transform warranty-related data from multiple sources is critical – as is the ability to apply the right machine learning algorithms to gain insights and make data-driven decisions in terms of design, manufacturing, material selection, documentation, or service changes.

Employing warranty analytics – such as root cause analysis, service pack optimization, and warranty risk profile analysis (quality issue prioritization) – helps manufacturers enhance customer loyalty and brand image. The early detection of potential failures in components and systems can also increase profitability by reducing claims and their associated costs. And warranty analytics tools can quickly and accurately detect fraudulent warranty claims before they become serious problems.

The advantages of investing in warranty analytics extends far beyond cost savings. By identifying which parts within existing products are likely to fail and why, product developers can improve designs, materials, and third-party suppliers, eliminating issues from future product generations. In regulated industries, early detection and response to potential safety problems are especially important, as this helps reduce and even prevent product recalls and liability actions.

With strong analytics capabilities, companies can accurately estimate warranty claim costs and allocate the right resources to manage them. They can also adjust warranty policies based on product reliability. For instance, if a component fails more often than expected, a company might enhance warranty coverage to protect brand value and maintain strong customer relationships.

# 17% ▲

2023 AUTOMOTIVE  
CLAIMS PAYOUTS  
TOPPED \$51 BILLION,  
MARKING A  
SIGNIFICANT  
INCREASE FROM THE  
PREVIOUS YEAR.

## Challenges to Analytical Accuracy

The integration of warranty claim data with other critical data sources – such as the bill of materials (BoM) and Failure Mode and Effects Analysis (DFMEA/PFMEA) – is essential in thoroughly diagnosing and resolving issues. But this process can be complex due to the variety of data formats and sources involved. Warranty-related data also comes from third parties, such as dealers, distributors, and service organizations, and these external sources frequently present data in inconsistent forms. As a result, before meaningful analysis can take place, the data must be gathered, normalized, cleansed, and structured in a standardized manner. This ensures analyses produce accurate insights and actionable results.

Another challenge stems from the textual nature of much warranty data. Many warranty issues are initially recorded as freeform text, which requires advanced natural language processing (NLP) techniques to extract key information. By leveraging NLP, analysts can transform this unstructured text into structured data, enabling the identification of recurring themes and patterns. Recent advancements in large language models (LLMs) and [generative AI](#) (genAI) have enhanced models' pattern recognition capabilities, enabling a more nuanced understanding of complex language, automated summarization of lengthy claim descriptions, and even the generation of insights and responses. This not only helps organizations categorize and prioritize warranty claims, it also provides valuable insights into customer sentiment, helping organizations better understand the causes of product failures and their impact on customers.

Assuming sufficient training data is available, machine learning enables analysts to predict customer behavior, returns, physical failures, software issues, and repair costs. As more claims are collected, the system's predictive accuracy improves. The challenge in predictive analytics is selecting the right machine learning strategy. With so many options of varying complexity, the simplest approach may yield poor results, while more complex ones require significant time to configure and test. The ideal strategy depends on many factors: desired accuracy, product range, data quality, time available for testing and deployment, and more.

## Altair Data Analytics for Warranty Analytics

Developing impactful warranty analytics starts with the data—but obtaining clean, well-structured, and ready-to-use data can demand significant time and resources. It's not unusual for data scientists and analysts to spend 80% of their time on data preparation. [Altair® RapidMiner®](#) dramatically reduces this burden, accelerating time-to-insight and enabling teams to focus on driving value, not wrangling data.

With a unified, end-to-end approach, Altair RapidMiner's [AI fabric](#) capabilities empower organizations to build and operationalize powerful warranty analytics systems that improve product quality, enhance brand reputation, detect fraud early, and feed continuous design improvement. Capabilities include:

- **Data Preparation:** As part of a unified AI fabric approach, organizations can seamlessly access, cleanse, and format warranty and service utilization data from CRM, ERP, channel partner systems, PDFs, Excel reports, and big data sources—all without manual data entry or coding. This cohesive, fabric-based architecture ensures data is reliable, traceable, and ready for analytics at scale.
- **Machine Learning:** Powered by an AI fabric, Altair's visual and explainable machine learning tools enable users to quickly build, train, and deploy predictive models across any environment. With automation and built-in transparency, teams can uncover failure trends, fine-tune warranty reserves, and design service strategies that improve customer satisfaction—all without disrupting development speed. Additionally, Altair RapidMiner allows you to combine newer technologies such as LLMs and agentic AI with more traditional approaches.
- **Streaming Analytics:** AI fabric extends to real-time analytics, empowering users to build streaming apps and interactive dashboards without writing code. Whether identifying fraud as it happens or predicting imminent equipment failure, teams can uncover insights in motion and make informed, proactive decisions in seconds—bringing together scalable data and AI to drive better business outcomes.



Use a visual workflow in [Altair® AI Cloud](#) to create an LLM to translate and categorize warranty issues.



Navigate your data using rich visualizations to uncover hidden insights.



Connect manufacturing and field data using knowledge graph technology.