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Boosting Service Quality and Customer Satisfaction through Warranty Analytics

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Warranty data is a valuable source of information to the services function of a manufacturer. The services team establishes the metrics and takes measurements off warranty data to understand the current state of the operation. In this article we focus on warranty analytics as used for cutting the lost costs in services delivery. There are two opportunity areas discussed – service network monitoring and product quality tracking. For each, we present the business case for the loss mitigation initiative and list the specific tools a manufacturer must use to get the desired insights.

Service Network Monitoring: Fraud and Abuse Mitigation

Despite the strong business case for fraud mitigation, most companies choose to ignore warranty fraud, considering it as an acceptable part of doing business1. One of the reasons for this is that the service channel is often also a sales arm, and companies are hesitant to come down hard on questionable warranty claims in spite of the impact on customers. A "customers first" approach benefits the complete value chain - from the manufacturer to the customer. In an interview1, loss prevention consultant R. Schmedlen has this to say, "... in a Newfoundland case, the dealer (who was not part of the fraud — one of his managers was stealing products and covering the losses with fake adjustments) reported that he had excellent feedback from his customers and that his sales of the product in question increased substantially in the following months."

Service network abuse of the warranty process happens in multiple ways. The service person can fake claims or claimants, can overcharge the manufacturer on the rendered services, or just not provide adequate service to the end-consumer. This hurts a company in multiple ways. There is the subversion of the product failure metrics of course, but the hardest hit is to the bottom line by way of part costs, call center charges, service charges and other reverse logistics expenses. Industry estimates suggest that for every $1 lost to an improper claim, the cost to the manufacturer can be as high as $62 that is a direct hit on the retained income.

Given the volume of loss a services operation cannot afford to not take action or to not continuously adapt over time. Service providers who are inclined to abuse, keep looking for ways to cheat the system. The audit processes need to stay current and keep looking for inconsistent patterns in the claims behavior. A formal audit process needs an analytical data mart for storing and processing the raw claims data and the supporting parts information. A decision support engine is built on top of the data mart to identify unusual claims patterns. Most manufacturers have the basic processes and technology to ensure that part claims are consistent with products under warranty. However, service network abuse does not necessarily show up in individual claim scans. Data have to be looked at in aggregate and a very useful algorithm for this type of analysis is derived off a scientific discipline known as fuzzy logic [3].

Here are some basic tactics that can be useful as part of the initial audit:

- Monitor the replacement of components that have high value on the gray market, e.g. SIMM chips for electronic component manufacturers.
- Compare the sales numbers for a given dealer-repair store relative to the claims filed.

- If the service channel also handles out of warranty calls, review in-warranty claims dated on or around the warranty expiration date for instances of backdating.
- Review the number of part replacements on warranty claims and monitor for unusual part combination replacements.

Fuzzy logic is used in detecting the deviations in service center behavior from the norm. This is distinct and superior to basic rule-based decision support. For example, it is not sufficient to put in a rule that any service center replacing more than 200 widgets a week is a suspicious. Fraudsters learn to fly under the radar. Alternately changes to product quality can quickly render the rules useless. Fuzzy logic institutes soft' rules wherein the service center is scored on a graded scale as per the level of suspicion relative to its peers. So a service center is considered suspicious when it is replacing 'too many' widgets compared to other service centers. This technique is self-adaptive. Fuzzy logic based decision support adapts to the changing environment and adjusts the suspicion levels accordingly.

Product Quality Tracking: Root Cause Analysis

Industry reports suggest that because the dealers replace the problematic part rather than repair it, the cost of component failure during a warranty period can be up to ten times the supplier's unit price4. Consequently, a focus on identifying the root cause of product failures and correcting the systemic problems can yield tremendous benefit to the bottom line.

Pattern analysis of warranty data can identify such cost savings tactics. The primary challenge is the high volume of data and the enormous number of component combinations and the product failure. The technology for running this analysis efficiently is based on an algorithm known as Association Analysis5. As the name suggests, the analysis looks for relationships between the attributes of the product — such as usage, production date, model type, model environment, part replacement history — and the occurrence of a specific type of part replacement or of service labor.

An extension of Association Analysis is the algorithm known as Sequential Pattern Analysis. This algorithm adds the dimension of time to the analysis. Thus, the analysts can find not only the correlation between the production month for a specific model and the component failure, they can also detect if this component failure is associated with other component replacements within the next few months. These patterns of product failure identify fundamental problems in the product, the failure diagnoses, or the service quality.

The discoveries of this type of analysis identify the correlation but do not necessarily imply a causal relationship between the product attributes and the failure. However, in practice, these discoveries often lead to significant cost-cutting opportunities. With one company where management focused on auditing the reverse logistics process, it was discovered that up to 40% of items returned through the call center process had no defects. Further analysis discovered that the high return rate was due to the customers being unable to understand the manuals that accompanied the products and the call center being unable to handle the complaints. Once the company made the diagnosis it was able to reduce the costs for the repair depot by up to 10% in the first year.

Next Steps

Management commitment is needed to ensure warranty data are collected, processed and used in managing the service network and product quality as discussed above. Resources and budget need to be

allocated to such forward looking initiatives. The costs of not taking action [1,4] far exceed the costs of these initiatives.

References

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