

## View Point



### Warranty Management: New Rules to Apply?

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The ability to manage change may well be the best competitive advantage any organization can build. Applying flexible Business Rules Management to Warranty Management Systems can help manufacturers make positive strides in achieving ongoing advantage by building an agile platform for their business users to develop, maintain, simulate and amend the frequently-changing business policy decisions (rules) which drive the Warranty Management process.

This paper outlines Infosys' solution for developing such an agile platform based on applying new rules to the process. If you can answer 'no' to one or more of the following questions, then this paper will offer new insight for addressing the Warranty System dilemma of today.

- Can your organization quickly change over its warranty coverages in response to moves by competition?
- Can you construct realistic "what-if?" scenarios to assess what the actual effect would be - in financial terms - of a revised strategy?
- In the face of increasing cost pressures, can your Warranty department apply more exacting standards to claims control and handling without increasing headcount or incurring significant IT support costs?
- Does your warranty system support pre-validation of claims on a line-by-line item basis so that service technicians can be advised of the best possible repair before they start the job?

## The Warranty System Dilemma of Today

For years, manufacturing companies - especially automotive OEMs - have struggled with a fundamental dilemma with regard to their warranty systems. Historically, the sheer volume and complexity of data associated with managing warranty claims for such a sophisticated product virtually demanded that claims processing be conducted via a mainframe-based application. However, there are a number of downsides to these legacy mainframe-based systems, not least their inflexibility. The warranty environment is hair-trigger sensitive, requiring rapid responses by OEMs' business user communities to competitors' offerings on a brand-by-brand, market-by-market basis in order to protect share. However, over time, various business policy decisions have been wrapped up within the systems under layers of unorganized and poorly documented code. This can become a nightmare to manage as well as to change as and when required, creating an environment where IT support is costly and unable to react quickly enough to the changing requirements.

Many OEMs awoke somewhat late to the size of the impact that ineffective Claims Processing and Assessment was having on their businesses, mainly:

- Excessive Warranty costs
- Inappropriate and ineffective repairs
- Inadequate and lagging product feedback
- Customer dissatisfaction
- Reduction in customer loyalty

## The Connected Organization

Infosys has long been a strong advocate of the "connected organization" as being key to achieving significant reductions in the enormous levels of warranty cost which have afflicted the industry for the past decades.

In its 2007 Viewpoint publication, "Warranty: From Liability to Competitive Advantage", the Infosys Warranty Management Practice described how enterprises seeking greater connectivity have increasingly looked for modern ERP (Enterprise Resource Planning) systems to provide the integration and scalability required to support their business. On the other hand, the generic warranty modules offered within ERP systems have had limited acceptance to date by the automotive industry, which did not view them as customized enough for their needs. Recognizing this, Infosys teamed with SAP to offer a warranty module pre-configured to meet the requirements of the modern global automotive industry.

ERP systems provide the necessary technological base that has the intrinsic benefits of collaboration and integration across the enterprise. A claims processing module, built on top of an existing ERP system, addresses the shortcomings of point-solutions in terms of flexibility and maintainability. At the same time, the module is inherently scalable, facilitating seamless data flow across the various enterprise functions.

Other features inherent in an ERP platform, such as Business Warehousing, Portals, etc., can be leveraged to share data with partners and mine useful information. Thus, the ERP Warranty component leverages the current ERP investment to streamline warranty processes by implementing best practices, and it provides a ready infrastructure to build partner-interfacing systems to improve collaborative innovation.

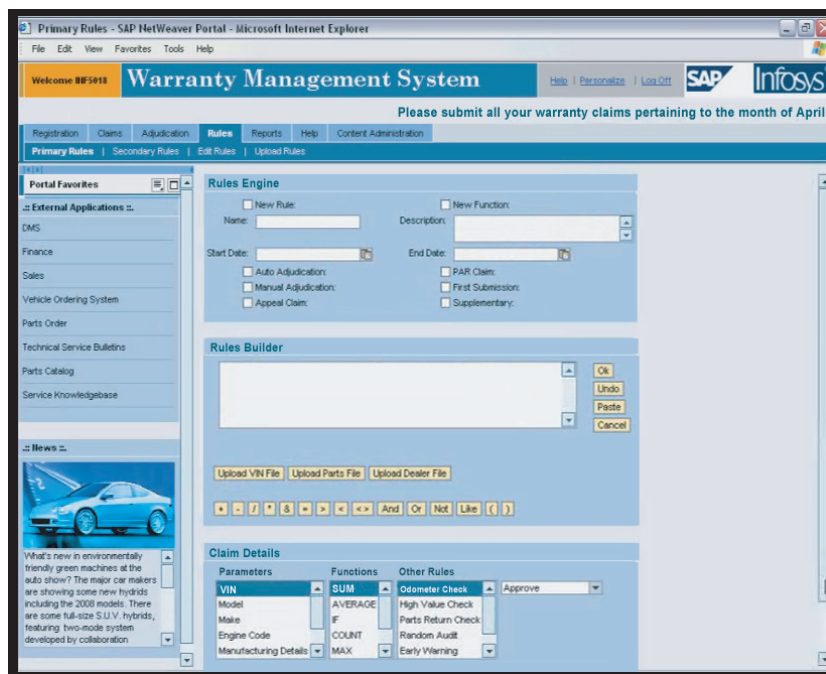
Regardless of whether service organizations adopt an ERP platform or continue with mainframe-based platforms, the industry focus is back on consolidating and standardizing business policies associated with Warranty Management across various makes and models of products. Therefore, it is highly imperative that Warranty organizations move towards capturing and documenting these business policies as rules and building an agile platform with an underlying rules management system to cope with the ever increasing competitive landscape.

## Rules Engines - Creating the Agile Business

A further enhancement to Infosys' aim of removing complexity and aligning business requirements with IT capabilities is provided by the incorporation into the solution of a Business Rules Management System (BRMS). An advanced rules engine is the heart of a next-generation warranty system, and has the major advantage of allowing users to manage validation parameters with a simple Graphical User Interface (GUI), rather than requiring the involvement of IT staff to amend the warranty systems. This allows warranty business users to carry out flexible, accurate and operational implementation of new business strategies in immediate response to the ever-changing external environmental and competitive factors characteristic of the warranty domain.

The claims-processing module, with a business rules-based engine at its core, can make it much easier to configure new rules and roll out new warranty programs while not requiring IT support. Advanced reporting facilities can be used to obtain meaningful information (through analytics), which can be fed back to the Engineering and Production departments, as well as be utilized for quality improvements. That is not to say that the implementation of a business rules engine, and the associated benefits, is restricted solely to an ERP environment. Engines may also sit on top of any claims systems - including existing mainframes - automating information exchange and business processes within and across systems.

As this space evolves towards modernizing some of the legacy Warranty management applications (without the ERP route), there is a further case to build upon an agile solution built on top of Business Process Management (BPM) and Business Rules Management systems (BRMS platforms). This will not only help organizations apply the right validations and rules but also orchestrate sharing this information to relevant applications across Engineering, OEMs and other internal and external partners (BPM Platforms).



*Infosys' Warranty Management Practice has showcased this new approach with a Business Rules Management engine embedded into an SAP warranty module pre-configured for the automotive industry.*

## Externalizing Business Rules from Warranty systems

This process typically starts off with harvesting the rules from the legacy applications and standardizing them to achieve maximum benefits from this exercise. Infosys' proven Rules Harvesting framework utilizes a hybrid approach which focuses on both the Top Down (workshops with business users, policy documents etc) as well as Bottom up approaches (Extraction from legacy applications code).

This exercise alone can give extensive benefits to the organization in the form of better documentation, rules pointing to exact code snippets to allow easy maintenance and enhancements, and most importantly, a platform to analyze these rules for standardization and optimization as needed.

Once these rules have been harvested and analyzed, they can then be put into rules repositories (BRMS) for easy maintenance and implementation, with any further analysis required to identify the minimal changes being done to the legacy applications and the integration patterns to be used for calling these rules which are then used as decision points or services.

Rules are then modeled using 'English-like language' which uses terminology for different entities and attributes as defined by the Business. This process helps maintenance and facilitates changes to be done later.

In this way most of the Business policy decisions pertaining to Warranty are externalized in such rules engines, thereby making their maintenance much easier and providing business with an ability to simulate, deploy and manage them in real life as needed.

## New Rules, New Benefits

To fully understand the benefits of this type of platform, we will now look at some of the automotive warranty and aftermarket practices which are further facilitated and enabled by this approach.

In recent years, OEMs have continued to struggle under the burden of a high absolute warranty cost.

One could argue that for many it has been a considerable achievement simply to hold the status quo in the face of considerable upward pressure caused by market demands for higher quality products at lower cost, longer warranty coverages, shorter go to market periods, increasing mechatronics content and legislative pressures. Manufacturers have been successful in addressing Warranty costs by using several key strategies:

- Tighter Warranty Controls
- Better-Built Vehicles
- Lower-Cost Repairs

However, the pressure remains to reduce costs still further. The onus is very much on the Warranty department to maximize its own operational efficiency of warranty claims handling as well as providing more accurate and detailed data than ever to support higher standards in product engineering and dealer repairs.

## Tighter Warranty Controls

In terms of warranty controls, in which areas does such an approach gain improvements? Warranty claims processing departments are under pressure to optimize:

- Auto-assessment of claims
- Speed with which claims are handled
- Consistency with which claims are handled
- Accuracy of future warranty claims level predictions.

At the same time they must keep claim levels down but also maintain maximum satisfaction levels with customers and dealers.

The areas where the flexibility of business rules implementation via a BRMS is having greatest effect in the Warranty Management domain is typically emerging around Claims processing (Accept / Reject / Adjusting / Posting), and matching the vehicle, causal part and/or repair information contained in the claim against pre-set parameters such as:

- Claim financial limits
- Coverage types and periods
- Requirements covering specific dealers or distributors
- Material return requirements

When such rules are maintained using a rules engine, it provides greater flexibility to business users in changing them as and when needed, or even simulating some of these changes to see the results ahead of a final decision.

Although claims processing is a crucial component of customer service, the process remains problematic for most OEMs. Inefficient, disconnected claim processes are not only costly per se, but also hamper an OEM's ability to perform real-time financial analysis. Claims exposure data, including reserve and loss information, is trapped in their legacy claims systems and not easily or quickly transferred to the enterprise general ledger.

The BRMS enables the Warranty department to achieve the type of sophistication of claims handling that has previously been possible only by manual assessment (but without the on-cost) plus greater consistency and with complete connectivity to downstream systems and partners.

The total cost of ownership for managing the business applications software will be significantly improved by reducing the extent of IT programming requirements and delays in implementing operational rules versus in past legacy environments. There are also some important, but not so explicit, benefits arising from a rules engine implementation. Firstly, a well-structured process of mining these rules from the legacy application helps with documentation of the correct business policies and provides another option for organizations to standardize them across brands and markets for better efficiencies and control. Secondly, the domain expertise around best practice for warranty policies is reassessed, along with the usage being made of business intelligence stored within the extended enterprise.

## Better-Built Vehicles

Embedded business rules can assist the drive towards higher quality, but here also the inflexibility of existing systems hampers true effectiveness. All parties involved in the engineering process - OEMs down to lower-tiered supplier - need rapid, reliable access to quality data and material in order to effect customer concern fixing. Quicker recall and inspection of parts can lead to major downstream savings through root cause defect analysis and resolution, so that engineers can introduce design or manufacturing process changes.

OEMs make requests for dealers to return parts, but often these are coded into mainframe-based claims processing systems, typically using table files, and consequently are not updated as often as they should be because of the IT resource requirement. This scattergun approach has two effects: either parts that would be of significance are not returned, or all parts within a given category are returned - as opposed to only those of interest to engineering because of a particular concern relating to one supplier or batch.

A modern business rules engine, with this type of simplified rules-builder interface and the ability to bulk-load VINS, parts or dealers, allows far more specific targeting of repairs, reducing costs from unnecessary parts returns and improving source material and information for the parts, inspectors and suppliers.

## Lower Cost Repairs

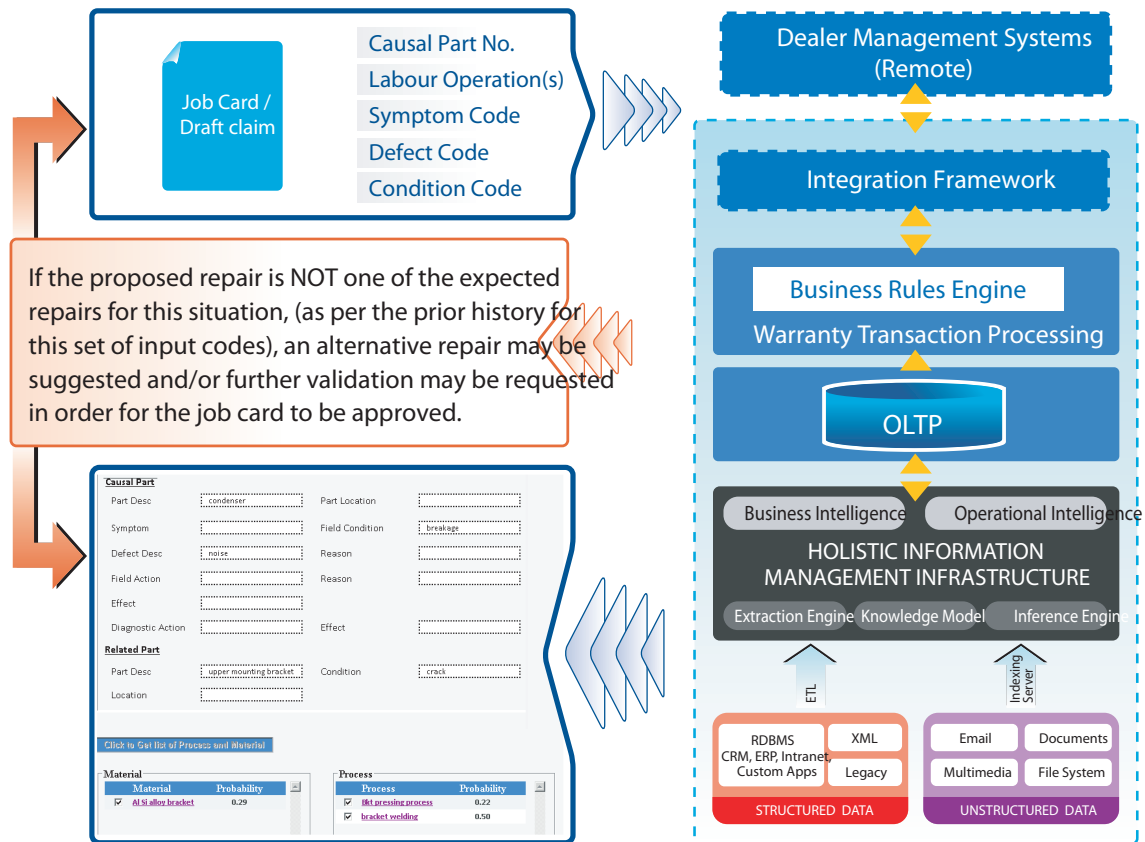
Aware that repair standards can vary significantly from one dealership to the next - and even within dealerships - OEMs have also sought to improve upon the cost, quality, speed, and consistency of repair offered by their dealer networks.

The most common response has been for OEMs to utilize, to a greater or lesser extent, prior approval requirements for dealers to inform the OEM (usually by telephoning or faxing the service or warranty department) of certain repair jobs before the work was carried out, notably:

- High-cost repairs, with a total material and labor cost over a set threshold
- Certain repairs involving hazardous parts, such as airbag units
- Certain repairs covered by service actions
- Goodwill repairs
- Labor-only repairs where there would not be a part for return and inspection, such as bodywork and paint repairs
- High-cost dealers and dealers on special performance improvement programs

However, these Prior Approval programs were managed using relatively unsophisticated technologies, and potentially draining considerable labor resources.

The sophisticated BRM engines embedded into the Warranty system as presented here will be able to perform this pre-validation in advance of actual submission, and with neither the labor expense, nor the time lag involved in the previous manual approach. Furthermore, with full integration into the quality analytics and service information systems, this has the potential to become a far more purposeful exchange, with the ability to advise and adjust repairs as soon as the job card has been drafted.



*Pre-validation of a job card using a Business Rules Engine and the Infosys HIMI tool.*

## Into an Agile Warranty Future

However, it is only after the Business Rules Engine becomes connected to the most advanced business and operational intelligence outputs that it really comes into its own, becoming far more than an advanced alternative to manual claims assessment. An environment where the value of the whole exceeds those of its parts.

The Holistic Information Management Infrastructure (HIMI) was developed within Infosys jointly between its Warranty Practice and its advanced technology laboratory, SETlabs. The HIMI tool incorporates an inference engine employing the very latest in data and text analytics and ontology-based modeling, utilizing a number of algorithms and logic rules for unearthing insights from the warranty claims data. These algorithms involve not only classical concepts of statistical structured data analysis and forecasting techniques, but also innovative techniques of text data mining and analysis and probabilistic inferencing using ontology and Bayesian Network techniques.

The pioneering work done in these areas is an emerging domain within the manufacturing industry in general and the automotive industry in particular, and opens up numerous possibilities for improved claims control and communication with partners and dealers.

As an example, we can return to the scenario of the Rules Engine acting as a gateway to pre-validate a job card submitted by a technician prior to the job being conducted and the resultant claim being submitted. The integrated system can scrutinize the data and text inputs to assess whether the proposed repair is the most appropriate one, based on statistical probability modeling.

Hence as the job card is being constructed for the technician, if certain information such as the defect and symptom code, causal part, condition code and proposed labor operation is submitted to the OEM for pre-validation, then the probability of a certain failure mode being to blame is calculated.

The claim system will then advise - or only accept - certain repair operations and at a certain cost

The job card may need to be amended because a repair is proposed that is based on a diagnosis that is not one of the most probable. The technician would then be asked to add extra justification, or the claim may be flagged to technical services for the nature of the concern and repair, or for higher-level authority for the claim reimbursement level.

## About the Authors

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