



Next Generation Warranty Systems

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Today's warranty systems deliver value to companies by increasing efficiency through process automation and workflow. The use of manual decision points within these processes and systems, however, creates bottlenecks and under-utilizes company expertise. Insight gained from data mining and analysis is restricted to the back office and IT resources cannot be freed up from systems maintenance. Next generation warranty systems act immediately, increase agility, consistency and accuracy, improving customer satisfaction, speeding response and reducing costs.

From tactical
improvement
of warranty to
strategic
warranty
management

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Next Generation Warranty Systems

Table of Contents

Introduction	3
Today’s warranty systems.....	3
Next Generation Warranty Systems	4
The Decisions in Warranty Chain Management	5
Decision Services for smarter processes.....	5
Building business expertise and insight into Decision Services	7
Decision Analysis for continuous improvement	10
The ROI of a focus on warranty decisions.....	12
Best Practices in Decision Management.....	12
Conclusion.....	13
About Decision Management Solutions	13

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References

This white paper can be found at www.decisionmanagementsolutions.com/warranty along with links to other articles and materials on the topic.

Sources with good examples and guidance include:

Davenport, Tom, and Jeanne Harris. *Competing on Analytics: The New Science of Winning*. Boston: Harvard Business School Press, 2007.

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Next Generation Warranty Systems

Introduction

Today's warranty systems deliver value to companies by increasing efficiency through process automation and workflow. The use of manual decision points within these processes and systems, however, creates bottlenecks and under-utilizes company expertise. Insight gained from data mining and analysis is restricted to the back office and IT resources cannot be freed up from systems maintenance. A new generation of warranty systems is required.

Next generation warranty systems recognize decisions as reusable assets and replace decision points like claim adjudication or fraud detection with Decision Services. These eliminate manual reviews, increase agility and put business users in control. Data mining and analytic insights feed back into these Decision Services to improve the accuracy and effectiveness of these decisions while ongoing Decision Analysis creates a process for continuous improvement. This approach is known as Decision Management.

Next generation warranty systems show a strong ROI and can be developed using techniques and approaches proven in other industries. With Warranty Week estimating that over \$40Bn is spent every year on warranty management, the time has come for a new generation of warranty systems to be developed.

Today's warranty systems

The potential for effective warranty chain management to affect a company's bottom line is clear. Many companies have been investing heavily in warranty systems to reduce costs and improve efficiency. Some companies have taken great strides in implementing claims processes and web-based claims systems. These validate claims before submitting them and use workflow to reduce costs and improve efficiency. The growth in data volume in the warranty chain has led to increased use of analytics and using warranty data for early warning fraud detection and monitoring vendors and suppliers.

Current approaches have limitations, however. They create manual decision bottlenecks, underutilize business expertise and analytical insights, are not aligned across the company and lack agility.

As warranty claims management becomes widespread, handling decision points becomes critical. For instance, the moment a webform validates a claim's data and assigns a claim number, a decision point is reached. Often it is clear whether the claim should be approved or not, yet in many warranty claims systems the decision point is handled by workflow with the validated claim being routed to someone for adjudication. This consumes time, money and resources. Next generation warranty systems act immediately, improving customer satisfaction and reducing costs.

Today most policies and regulations are written up as requirements and then coded into systems after waiting in the IT queue. Next generation warranty systems use Decision Services to enable ownership by and visibility to the business, allowing for the agility the business requires.

The use of analytics to find fraudulent claims is growing - fraud analysts work on the data to find the key risk factors for fraudulent claims. But this analysis is done after the fact, resulting in a "pay and chase"

Next Generation Warranty Systems

approach that puts companies on the defensive. Next generation warranty systems apply this fraud insight so the claims that need review are flagged *before* they are paid, reducing costs and improving the odds of catching fraudsters. Analytics are also used to assess the effectiveness of independent agents or the reliability of particular parts and suppliers, but this information is typically not fed back into the decision points where contracts are assigned. Next generation warranty systems use the analytical insights to improve these assignments.

Sales and marketing approaches are often inconsistent with the warranty chain decisions being made, increasing costs and decreasing the value to the company of its warranty effectiveness. For example, extended warranties are an important offering to customers. Many companies are using analytics to get greater visibility insight into the most and least profitable offerings. Next generation warranty systems feed this knowledge seamlessly back to their front line so that sales and marketing have appropriate incentives and measures to ensure the right products are promoted.

Business Process Management, Business Intelligence, Warranty software packages and custom development projects have all brought value and cost savings to warranty claims management. Decision point bottlenecks limit these systems because they underutilize business expertise and analytic insight and because they restrict business agility. A new mindset, one focused on the decision points within warranty processes, is needed if these problems are to be addressed.

Next Generation Warranty Systems

Next generation warranty systems focus on the *decisions* in the warranty chain, recognize these decisions as reusable assets and make them widely available via Decision Services. Such a decision-centric approach enables warranty feedback and experience to be integrated into the whole product life cycle and brings the company's know-how and expertise to bear at every step in the warranty chain. At the heart of this new mindset is Decision Management - an approach for replacing decision points with Decision Services and improving business performance by identifying the key decisions that drive value in the business and improving on those decisions by leveraging a company's expertise, data and existing systems.

Companies adopting Decision Management can build on their existing systems to build next generation warranty systems that improve warranty chain processes. They focus on warranty chain decisions through Decision Discovery; make these decisions available via Decision Services and use business rules to manage and add analytic insight to improve these decisions; and create a continuous improvement loop for these decisions with Decision Analysis.

Next Generation Warranty Systems

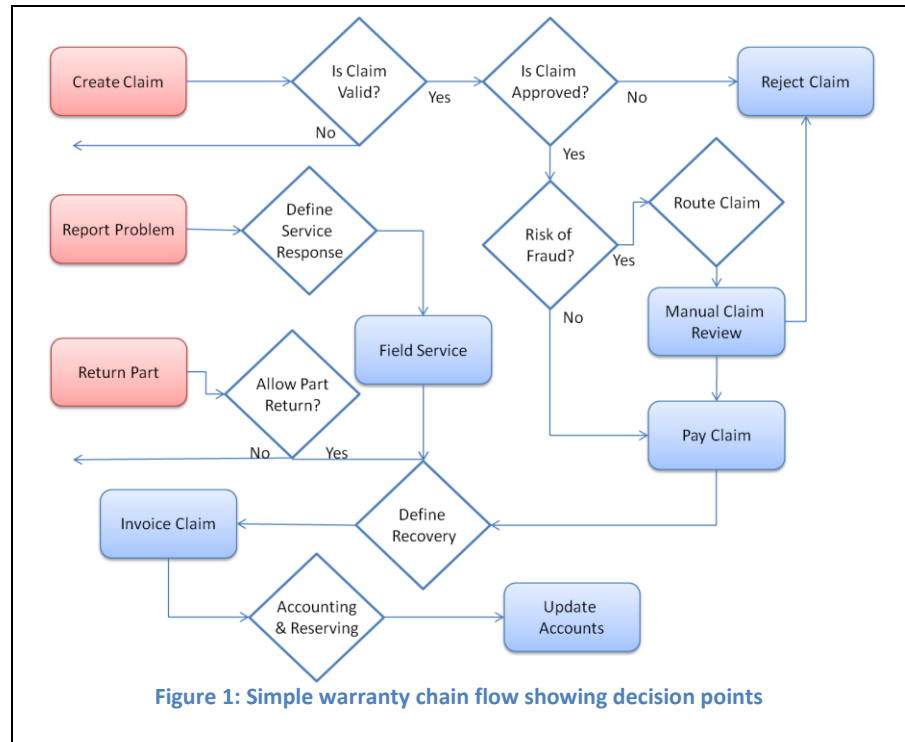
The Decisions in Warranty Chain Management

Decision Management improves warranty processes and systems by externalizing the decisions that drive warranty process performance. Decision Management ensures that the right claims are approved, that recovery policies are applied correctly and consistently, that the most effective routing is made and that the right actions are taken.

Decision Discovery is the first step in applying Decision Management and involves identifying the high value decisions that will provide the biggest pay-off for a warranty processes. A simplified warranty chain process contains a number of critical decisions, perhaps like those shown in Figure 1.

There are other decisions in the warranty claims process and in adjacent processes but these illustrate the opportunity in applying Decision Management.

With next generation warranty systems, each of these decisions is handled differently from the past as shown in Table 1.



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Decision Services for smarter processes

A Decision Service is a modular software service built on a company's existing systems, using its data and know-how. The business owns these Decision Services, so they remain explicit, visible and flexible. Decision Services are components or services that answer business questions for other services – is this claim valid or should this claim be approved, for example.

A Decision Service is built on standard software and technology components and often uses Web Services standards for ease of integration. It literally takes the business know-how out of departmental silos and policy manuals and makes it available to all aspects of the business, both within and beyond the warranty value chain. Critical decisions, like those discussed above, are implemented in a modular way and the business owns the logic within these modules.

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Decision	Today	Next Generation
Is Claim Valid?	Data validation rules are coded into the user interface that captures claims. Any changes in rules have to be routed to IT.	The validation rules for the large number of parameters and multiple warranties are managed by business owners based on published warranty terms and conditions. Changes are made by those who understand the rules.
Is Claim Approved?	Relatively few claims are auto-adjudicated, most are routed to representatives. Only simple approvals are handled and these are hard to change.	90% or more of claims are automatically approved and the remainder is routed to a representative. The rules are managed by warranty experts and come from a large range of sources (parent company, regulations, policies, offers, recalls) to ensure completeness
Route Claim	Simple routing rules can be defined as part of the workflow to, for instance, route claims related to certain parts to certain experts.	Claims are intelligently routed to one of the many potential agents or representatives who could review them. Some specialize in particular kinds of claims; others might cover a particular region. Managers constantly update these rules to manage workloads and skill sets.
Risk of Fraud?	Either no checking is done at this decision point or it is both simplistic and deterministic, such as refusing claims from known fraudsters.	Every claim is assessed to see if the risk for that claim is high enough to route for review. An analytic risk score is combined with the value of the customer and the value of the claim. Analytics enhance the rules to catch more potential fraud and manage risk.
Define Recovery	Recovery is handled manually for all but the simplest situations, with policy manuals and contracts being used to drive actions.	The rules for this can be very complex as, for instance, a claim for a part made by a third party but installed in the original product might go back to the manufacturer where a second claim for the same part goes to the third-party who manufactured the part. Contract experts manage the rules so all claims are recovered appropriately.
Accounting and Reserving	Similarly to recovery, this step is a largely manual one. Reserving is manual and conducted no more than quarterly.	The rules for accounting change constantly as distributors and accounts change, each with their own rules. These rules are managed by those who own the accounts ensuring they stay up to date. Reserving becomes a precise exercise driven by actual transactions rather than an exercise in averages and reserves are updated more often.
Define Service Response	Service requests are allocated using geographic or workload rules coded into the system.	Performance-based assignment is integrated with contractual and best practice rules to maximize the effectiveness of service responses.
Allow Part Return?	Simple return rules are coded into the system but most returns are manually assessed.	All aspects of part return are considered and automated so that the vast majority of returns can be handled without manual intervention.

Table 1: Decision Points today compared with Next Generation Decision Services

Next Generation Warranty Systems

Building Decision Services is different from building other components in some key ways:

Decision Services enable companies to bring company strategy and values directly to the front line, while maintaining and enhancing business agility. Decision Services capture valuable expertise and tribal knowledge and apply it to the appropriate business problem – increasingly important as baby boomers age and retire. Decision Services help ensure compliance by allowing the in-house experts to direct actions on the front line according to the regulations and policies that are supposed to be applied. Decision Services allow front line decisions to be made “on the spot”.

- Decisions are explicit and modeled accordingly
- Logic is declarative, not procedural
- The business owns the ongoing maintenance of the logic
- Analytic insight is integrated

It is essential that development is done by a cross functional team of business, IT and analytics experts. An initial decision is typically deployed first with a set of rapid iterations expanding the number of decisions included and reducing the transactions requiring manual review. Subsequent process and organizational alignments are suggested as the benefits of the Decision Service create opportunities. Business owners use and revise the business logic as business conditions change.

As an example, two large North American Auto distributors are using this approach within their warranty systems. In both cases the systems themselves are custom developed, with decision making logic handled by series of Decision Services – Claims Validation, Claims Approval, Claims Recovery and Claims Accounting –built using Fair Isaac’s business rules management system. Some packages such as those from Tavant Technologies and ServiceBench contain pre-defined Decision Services for specific decisions. Both approaches work.

Building business expertise and insight into Decision Services

Business expertise, policies, regulations and analytic insight must all be built into Decision Services. Expertise, policies and regulations are managed using business rules and these business rules become the core of any Decision Service. Business rules are statements of the actions that should be taken when certain business conditions are true. Business rules capture the policies and practices of a business organization. These business rules are in a language the business and IT can both understand like that shown in Figure 2.

Business rules are the core building block of decisions and of Decision Services. Business rules are “atomic” - each is a single statement that can be reused and managed separately. A business rule is declarative – it describes the *what* (the desired business outcome), not the *how*. The business rule is

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Next Generation Warranty Systems

applied in the relevant business context, not in a rigid sequence. Business rules are maintained in a repository that is updated by both business and technical users.

One of the reasons for managing business rules, and using those business rules to make decisions, is that decision changes are driven by numerous business factors.

Companies sometimes have little or no control over the details of these changes or the deadlines for making these changes. They must sometimes comply very rapidly.

Business rules are ideal for this kind of change cycle because they can be changed independently and because it is easy to verify them against new policies, regulations etc.

*If ThisClaim's DateOfRepair is at least 30 days later than ThisClaim's FailureDate
then set ThisClaim's Status to "Manual Review"
and set ThisClaim's ReviewReason to "Too long between failure and repair"*

*If ThisClaim's Mileage is greater than OtherClaim's Milage
and ThisClaim's FailureFate is earlier than OtherClaim's FailueDate
and ThisClaim's SerialNumber is the same as OtherClaim's SerialNumber
then set ThisClaim's Status to "Manual Review"
and set ThisClaim's ReviewReason to "Greater mileage but earlier failure date for the same part"*

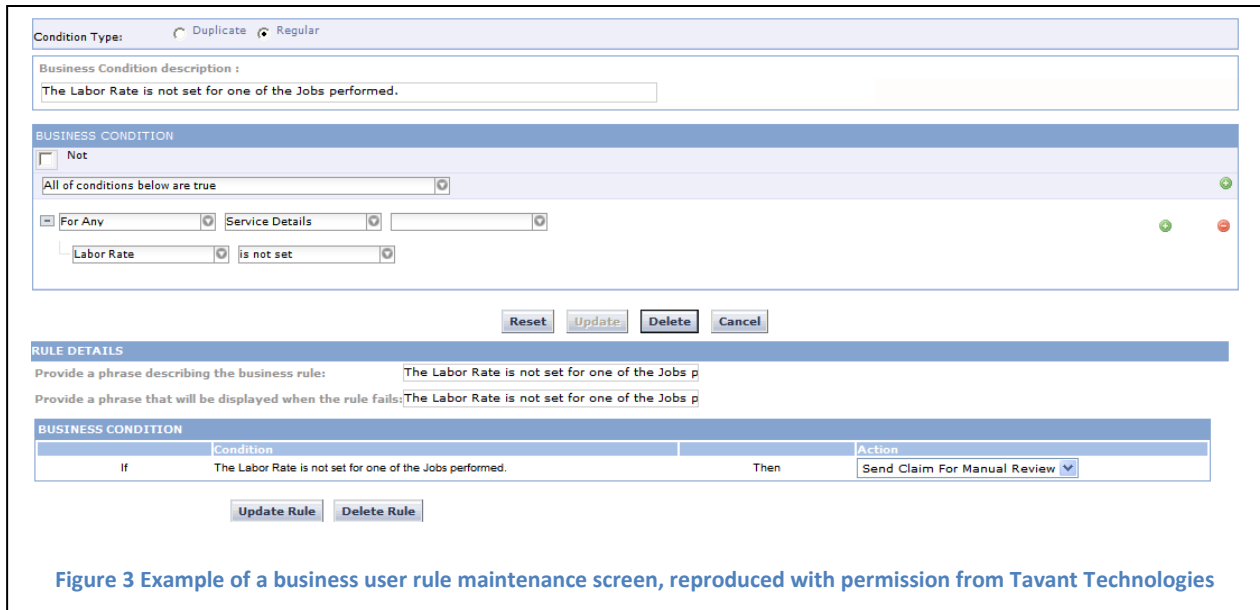
*If thisPart is of type "Battery"
and thisPart's InstallDate is greater than 30 days ago
then set thisPart's Status to "Not Eligible"*

Figure 2 Examples of business rules

For example, one North American Auto distributor found that there were two main kinds of rule changes – large scheduled ones and frequent smaller ones. Their old process worked well for the larger, scheduled changes like the release of a new model but it could not keep up with demands of the business for ongoing adjustments such as a spike in claims, adding distributors with a different set of accounting rules or a change to MSRP reimbursement from cost+markup reimbursement. These changes had to be made every few weeks. Business rules really show their value with these kinds of changes as they eliminate the need for long development and change cycles and so dramatically reduce the time to implement the changes. Business rules can also change based on experience with real world use as when a distributor replaced a dealer-set recovery option with specific recovery rules when it realized dealers always picked the same option.

Warranty environments can have a lot of rules – multiple models, varying warranty terms, recalls and more all create a need for more rules. Fortunately business rules technology is well suited to this problem. Business users at one Auto distributor, for instance, managed over 50,000 rules to support their Decision Services. Modern business rules technology deliver the management and execution performance needed for any warranty scenario.

Next Generation Warranty Systems



Some organizations have their IT department manage the business rules and some have business users take direct control. Others have a blended approach to suit their organization. Of the two auto distributors, for instance, one uses IT to manage rules while the other empowers its business users directly. A major warranty processor exposes the warranty rules unique to each of its retail clients, giving its business users a spreadsheet-like business rules environment. Among vendors, ServiceBench and 4CS use a blended approach for their adjudication rules while Tavant Technologies exposes policy terms, claim processing rules and supplier contract rules directly to business users as shown in Figure 3.

Most companies steadily increase business ownership of the rules. While it only takes five minutes for IT to make a rule change, it can take 2-4 weeks to get through IT processes and change control. This uses up a great deal of IT resources that could be better applied elsewhere. Though not a significant issue with large changes; it rapidly becomes expensive for smaller ones. For instance, a recall campaign might start driving lots of claims and only once the claims are being processed will a needed change become apparent. A change like parts pricing or vehicle supply might also create an urgent need for change. In these circumstances the business' ability to make the change themselves maximizes agility.

One auto distributor developed an application that allowed business users in the warranty administration department to manage their rules. These business users can add and update business rules themselves, without the need to use precious IT resources. The right rules are managed by the right group with the right expertise. Business rules for mass recalls might be handled by one group while another handles rules associated with parts, labor, paint etc. These different groups are each able to access and maintain their own rules in the repository and then have the right mixture deployed in support of a particular decision so that the different decisions

Business rules can be managed directly by adopting a Business Rules Management System such as Corticon Business Rules Management System, Fair Isaac® Blaze Advisor, ILOG JRules (an IBM company), or JBoss Drools. Some vendors, such as 4CS, ServiceBench and Tavant Technologies are offering rules-based environments as part of their product offering.

Next Generation Warranty Systems

throughout the process each use the appropriate rules. Other types of business rules include policy terms and conditions, data validation for claims, claims processing rules, parts return rules, recovery terms and conditions as part of supplier contract and claims routing e.g. by product line.

Business rules are not the only kind of company know-how that needs to be applied in Decision Services. Applying analytic insight to warranty decisions allows these insights to be applied directly into day to day operations for maximum effectiveness. To do this, the tools and techniques of data mining and predictive analytics come into play. Data mining and analytics are used first to improve the business rules. When writing rules about disbursements for instance, analysis of past disbursements may well provide useful clues as to what the disbursement rules are meant to be. One auto distributor is using data mining to improve fraud rules and cut offs while some users of ServiceBench's products are reviewing groups of claims identified as needing investigation through fraud analytics and creating rules to push similar claims into manual review.

Business rules are often used to divide claims or suppliers into groups that will then be treated differently- to identify the "most reliable" suppliers and use them more often say. Straightforward analysis of data can be used and data mining techniques can automate and formalize the process of extracting these rules from historical data. Tavant Technologies and one of the auto distributors discussed earlier are using data mining techniques to find the rules implied by their data. ServiceBench has integrated its data mining engine to allow options such as assigning work to the most efficient service agents based on pay for performance analytics.

Data mining techniques can also analyze historical data to make predictions. These are rarely absolute statements but are more likely to be odds of a particular event taking place in the future ("Parts of type X are twice as likely to fail in the first six months as not"). These techniques turn uncertainty about the future into a usable probability – from not knowing which part is a reliability risk to estimating roughly how likely one is to be a reliability risk, for instance.

One white goods manufacturer uses SAS Warranty Analytics and SAS Enterprise Miner to build dozens of distinct risk models to calculate an overall score for claims. A higher total score means more risk of fraud. Other companies are beginning to use text analysis to score claims where there is a low probability that the technician comments match the customer complaint code selected, for instance, or where technician comments indicate that parts listed on the claim are not needed. These scores are integrated with rules-based decisions so that the analytic insight is fed directly into the warranty chain decisions. Business users can change thresholds and manage the impact of the scores while analytic experts handle the technical issues of data and analytics.

Decision Analysis for continuous improvement

It is often said that nothing in business can be improved if it cannot be measured and decisions are no exception. Decision Analysis – the application of performance management techniques and technologies to the monitoring of decisions – is critical. Too many corporate measures and performance indicators are not tied to the decisions that affect them. For Decision Management to work the business must

Next Generation Warranty Systems

understand how specific decisions create or destroy value and must link these decisions to the business and individual performance metrics being tracked.

Most organizations use KPIs extensively today to measure performance at both a corporate and a departmental or individual level. Mapping decisions to these KPIs will focus people on the decisions that matter. It is typically clear that decisions will impact one of more KPIs. For instance, SAS Warranty Analytics provides a dashboard for monitoring KPIs including one for Claims Processing Cost. The effectiveness of the claims adjudication decision in correctly identifying those claims that can be automatically processed makes a material contribution to this KPI.



Figure 4 A Warranty Analytics Dashboard, reproduced with permission from SAS.

Making sure all decisions being managed map to a KPI (or to more than one) and that all KPIs have at least one decision that impacts them is important in ensuring that a complete model of the decisions that matter has been developed.

Besides mapping decisions to KPIs and so understanding their impact on the business, it is necessary to monitor the performance, throughput and basic statistics of decisions. How many decisions are made to approve, reject or refer, for instance, is a measure of decision effectiveness. Too many referrals will increase the burden on the staff doing manual reviews. Too many rejections, thanks to false positives for instance, will impact customer service or sales. Similarly, decisions that take too long or that cost too much may have a negative overall impact. Tracking and reporting on this information will help the business owners understand and thus manage their decisions more effectively.

To manage changing circumstances, companies can constantly challenge the way a decision is made to see if the approach being used remains valid. Improving decisions over time, given changing business constraints, ensures that optimal decision making becomes the norm.

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Next Generation Warranty Systems

The ROI of a focus on warranty decisions

Companies that have adopted a Decision Management approach, implemented business rules and begun applying data mining and analytics have seen a return on their investment in many areas:

- One auto distributor now automatically approves 85-90% of claims, up from the 60% in the old system, and the percentage continues to climb slowly as more rules are added.
- Another company using a package solution with rules-based claims adjustment and routing reduced their claims backlog by 60-80%.
- One warranty claims processor used a business rules management system to reduce adjudication turnaround from one week to 24 hours.
- Automating the recovery decision has been seen to increase supplier recovery up to 100%
- Feeding back risk and fraud models into the claims adjudication decision saved millions of dollars for a white goods manufacturer.

In addition companies have reduced scrapped parts, restricted fraudulent activities and reduced warranty reserves. Companies that have empowered business users, like the auto distributor discussed above, find that moving the rule maintenance process from the IT department to the business has been a big success. There was originally reluctance from the IT department but now they support the change also. The business is much more engaged, accuracy is greatly improved and constrained IT resources are better utilized. The business has discovered that they can handle their own system – critical given how important systems are to the business today.

The ROI can be further increased as warranty decisions are reused across other processes. For instance, marketing campaigns can be integrated with campaign recalls by accessing the warranty claims rules and decisions. This reduces costs and increases effectiveness in processes outside warranty claims.

Best Practices in Decision Management

Decision Management is firmly established as a best practice in industries such as insurance, credit and retail marketing. Companies in these industries have benefited by adopting Decision Management to deliver impressive results. Best practices can be gained from companies in these areas as they share similar business challenges to warranty such as complex claims approvals and fraud detection as well as customer service. For example:

- Putting more and more rules into the hands of business users improves agility and accuracy. Business users can own their applications and make changes rapidly, safely and effectively.
- It is critical to adopt a “test and learn” mentality to keep challenging how decisions are made and to develop new approaches that improve over the existing ones.
- Data mining and analytic insight are most valuable when they can be applied to the handling of individual transactions and customers through embedding them in Decision Services.
- Detecting fraud before payment is dramatically more effective and a combination of business rules written by experts and adaptive analytic models is very effective.
- Processes can be simplified and made more agile if decisions are externalized and managed as distinct Decision Services.

Next Generation Warranty Systems

Conclusion

Companies have used workflow, business process management, webforms, integration and analytics to bring improve the efficiency of warranty processes. They have eliminated duplicate data-entry, reduced delays and increased their understanding of their warranty claims. This work provides the foundation for a new generation of warranty systems.

Next generation warranty systems use a decision-centric approach to replace the largely manual decision points in the warranty claims process with automated Decision Services. These Decision Services put business know-how, tribal knowledge, expertise and historical data to work to ensure that consistent, accurate decisions are made automatically throughout the process.

Moving to a decision-centric approach comprises three main phases: Decision Discovery; Decision Services; and Decision Analysis. Decision Discovery identifies the high value decisions within the warranty chain that will provide the biggest pay-off. Decision Services take these decisions and incorporate the business rules and the analytic insight needed for better decisions. Initial deployment is followed by a set of rapid iterations based on Decision Analysis, expanding the range of decisions being managed, increasing the number of decisions handled, and reducing the number requiring manual review.

About Decision Management Solutions

Decision Management Solutions provides consulting and implementation services in all aspects of Decision Management. Decision Management improves business performance by identifying the key decisions that drive value in your business and improving on those decisions by leveraging your company's assets: expertise, data and existing systems.

Our end-to-end, decisions-based approaches and methodologies address key business priorities—such as cost competitiveness, differentiation, customer retention and growth. We offer a range of consulting services for companies ranging from strategic advice about adopting Decision Management to tactical support for successful implementation projects.

Decision Management Solutions is led by James Taylor, one of the leading experts in Decision Management. James has over 20 years experience in developing software and is the foremost thinker and writer on Decision Management. In addition, Decision Management Solutions has an extensive network of industry and implementation partners. James has experience in all aspects of the design, development, marketing and use of advanced technology and has consistently developed approaches, tools and platforms that others can use to build more effective information systems.

More information is available at <http://www.decisionmanagementsolutions.com/rules>

To engage us or request information, email us at info@decisionmanagementsolutions.com.