



Decision Management Systems Platform Technologies Report

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The adoption of Decision Management Systems helps organizations meet the demands of consumers, regulators, and markets. In this section of the Report, we'll explore the many uses for Decision Management Systems across a wide swath of industries and situations.

There are many compelling use cases for Decision Management Systems. Any time an organization must make a decision over and over again and where the accuracy or consistency of that decision, its compliance with regulation, or its timeliness are important, Decision Management Systems play an important role. Organizations can often spot such decisions by looking for decision words such as determine, validate, calculate, assess, choose, select, and, of course, decide. For instance:

- ▶ Determine if a customer is eligible for a benefit
- ▶ Validate the completeness of an invoice
- ▶ Calculate the discount for an order
- ▶ Assess which supplier is lowest risk
- ▶ Select the terms for a loan
- ▶ Choose which claims to Fast Track

This section of the Report discusses use cases by decision type and by industry and outlines some general guidance to identify decisions suitable for Decision Management Systems.

Navigating the Report

The [*Decision Management Systems Platform Technologies Report*](#) is a set of documents describing the best practices and technologies for building Decision Management Systems.

1. *Introducing Decision Management Systems*
2. *Use Cases for Decision Management Systems*
3. *Best Practices in Decision Management Systems.*
4. Five Key Capabilities
 - 4.1. *Managing Decision Logic with Business Rules*
 - 4.2. *Embedding Advanced Analytics*
 - 4.3. *Optimizing and Simulating Decisions*
 - 4.4. *Monitoring and Improving Decisions*
 - 4.5. *Modeling Decisions*
5. *Selecting Products for Building Decision Management Systems*

All readers should begin with *Introducing Decision Management Systems* as it gives an overview of the category, technologies and rationale.

Business and technical readers can continue with *Use Cases for Decision Management Systems* and *Best Practices in Decision Management Systems*.

Business and Technical Track	Technical Track
Introducing Decision Management Systems	Managing Decision Logic with Business Rules
Use Cases for Decision Management Systems	Embedding Predictive Analytics
Best Practices in Decision Management Systems	Optimizing and Simulating Decisions
	Monitoring Decisions
	Modeling Decisions
	Selecting Products for Building Decision Management Systems

Technical readers are recommended to read the five Key Capabilities documents (*Managing Decision Logic with Business Rules*, *Embedding Advanced Analytics*, *Optimizing and Simulating Decisions*, *Monitoring Decisions* and *Modeling Decisions*) to better understand the component technologies of Decision Management Systems. *Selecting Products for Building Decision Management Systems* will be useful as part of assessing technology needs.

More information on the report, its scope, reproduction and more is in the final section *About The Decision Management Systems Platform Technologies Report*.

Use Cases by Decision Type

The decisions have certain characteristics that make managing decision logic, optimizing trade-offs, and embedding predictive analytics valuable. It is useful to categorize decisions into various types, though some decisions include characteristics of several types. For instance:

Eligibility or Approval—Is this customer/prospect/citizen eligible for this product/service?

These decisions are made repeatedly and should be made consistently every time. The use of a business rules-based system to determine eligibility or to ensure that a transaction is being handled in a compliant way is increasingly common. These decisions are policy and regulation-heavy and the use of a Business Rules Management System to handle all the business rules is very effective. While eligibility and compliance decisions can seem fairly static, changes are often outside of the control of an organization and can be imposed at short notice.

Validation—Is this claim or invoice valid for processing?

Validation decisions usually are operational, they are overwhelmingly rules-based, and the rules are generally fixed and repeatable. Validation is often associated with forms and online versions of these forms are of little use without validation. The move to mobile apps makes validation even more important.

Calculation—What is the correct price/rate for this product/service?

Calculations are usually operational and they are overwhelmingly rules-based. The rules are generally fixed and repeatable but making them visible and manageable using business rules pays off when changes are required or when explanations must be given. Sadly, calculations are often embedded in code.

Risk—How risky is this supplier's promised delivery date and what discount should we insist on?

Making a decision that involves a risk assessment, whether delivery risk or credit risk, requires balancing policies, regulation and some formal risk analysis. The use of business analytics to make risk assessments has largely replaced “gut checks” and predictive analytic models allow such risk assessments to be embedded in systems.

Fraud—How likely is this claim to be fraudulent & how should we process it?

Fraud detection generally involves a running battle with fraudsters, putting a premium on rapid response and an ability to keep up with new kinds of frauds.

Managing the expertise and best practices required to detect fraud using business rules gives this agility while predictive analytics can help with the kind of outlier detection and pattern matching that increases the effectiveness of these systems.

Opportunity—What represents the best opportunity to maximize revenue?

Especially when dealing with customers, organizations want to make sure they are making the most of every interaction. To do so, they must make a whole series of opportunity decisions such as what to cross-sell or when to upsell. These decisions involve identifying the best opportunity, the one with the greatest propensity to be accepted, as well as when to promote it and where. A combination of expertise, best practices, and propensity analysis is required.

Maximizing—How can I use these resources for maximum impact?

Many business decisions are made with a view to maximizing the value of constrained resources. Whether it is deciding how best to allocate credit to a card portfolio or how best to use a set of machines in a production line, deciding how to maximize the value of resources involves constraints, rules and optimization.

Assignment—Who should see this transaction next?

Many business processes involve routing or assignment. In addition, when a complex decision is automated it is common for some percentage to be left for manual review or audit. The rules that determine who best to route these transactions to and how to handle delays or queuing problems can be numerous and complex, ideal for managing in a Decision Management System.

Targeting—What exactly should we say to this person?

In many situations there is an opportunity to personalize or target someone very specifically. Combining everything known about someone with analytics predicting likely trends in their behavior and best practices, and constraining this to be compliment with privacy and other regulations, individuals can feel like the system is interacting only with them.

The rest of this report will focus on specific use cases that have been handled using Decision Management Systems.

Every one of these examples has been successfully implemented at a client of Decision Management Solutions or of one of the vendors in the report. [Email us](#) for more information.

Use Cases by Industry

The use cases in this report are divided into a number of categories. Some of these are verticals, such as the section on government operations, while others are focused on categories relevant to multiple industries such as fraud detection or personalization. Within each section a number of real examples are explained but this is not an exhaustive list of possible use cases. The sections are:

- ▶ Fraud Detection
- ▶ Underwriting and Origination
- ▶ Marketing
- ▶ Personalization
- ▶ Collections
- ▶ Government Operations
- ▶ Supply Chain Management
- ▶ Asset Management
- ▶ Manufacturing
- ▶ GRC
- ▶ Healthcare
- ▶ Process Efficiency

Reading all the cases will give you the best feel for the breadth of possible uses of Decision Management Systems but jumping around to sections that seem the most relevant to you will also work, giving you a chance to find use cases that will resonate with you and your partners.

Fraud Detection

Many organizations suffer losses from fraud and abuse. These range from fraudulent claims for services that were never performed, to applications for credit for people that don't exist, to orders that include bribes and illegal payments. In every case, an organization must decide whether to accept the transaction as valid, reject it or investigate it for fraud. These decisions are high volume as they must be made for each transaction and are ideal for automation using a Decision Management System. Fraud detection systems typically involve business rules for compliance with policies and regulations as well as predictive analytics to match the current transaction to patterns known to be fraudulent or identify that the current transaction looks very different from legitimate ones.

A wide variety of fraud detection and handling Decision Management Systems are built, and fraud detection is one of the primary use cases for Decision Management.

Specific examples of use cases are listed below and it should be noted that all these decisions are increasingly combined into an integrated fraud management system.

Transaction Is Fraudulent

The basic fraud detection use case. Organizations will withhold payment, withhold partial credit, or decline a payment to prevent fraud. Suitable transactions include warranty claims, insurance claims, credit card payment, auction payment, tax returns and many more. Besides the basics of declining or only partially paying, some Decision Management Systems will identify transactions that require follow-up, such as a call from your credit card issuer, even though the transaction was accepted.

Application Fraud

A variant on transaction fraud is application fraud. For instance, when a consumer or organization is applying for service, especially one provided on credit or involving other risks to the provider, a Decision Management System can be used to determine if the application is fraudulent and how to handle it in terms of review or rejection.

Identity Fraud

When someone applies for a service or product, or makes a transaction, it is important that they are who they say they are. At other times, also, the use of a Decision Management System to identify potential identify fraud is highly valuable. Such systems can be part of preventing application or transaction fraud but can also be used independently, such as for security or access control.

Supplier or Provider Is Fraudulent

Even when a transaction appears valid, it is possible that it is associated with a provider of a service or good that has a pattern of behavior that suggests fraud. Decision Management Systems are used to identify those suppliers or providers of service, in healthcare for instance, that have a pattern of such behavior so that even apparently valid transactions can be reviewed before being paid.

Fraud Network

The newest Decision Management Systems in fraud are focused on fraud networks. These decide if the combination of customers, suppliers, inspectors and auditors, or the combination of doctor, patient, pharmacist, and claimant together represent a fraud risk. Each of the individuals may seem fine, and the transaction likewise, but the network is fraudulent.

Underwriting and Origination

Another well-established area for Decision Management Systems is that of underwriting and origination. Whether originating loans, mortgages or credit, or underwriting insurance, these decisions offer a strong use case for Decision Management Systems. Often regulated and constrained by policy, these decisions

can be effectively managed using business rules. An assessment of risk is often critical to deciding what price or terms to offer: higher risk customers must provide more documentation or pay a higher interest rate. The use of predictive analytic models to predict risk in these circumstances is also well established. Combining these business rules and predictive analytic models into a Decision Management System is a very effective tool for automating the underwriting decision.

A series of set of decisions are typically involved in originating or underwriting and Decision Management Systems have been built for many of these.

Quoting

An initial calculation of the likely price drives a quoting decision. Some Decision Management Systems provide only an estimated quote while others use more complex decisioning, including a risk assessment, to produce a bindable or committed quote that the company is willing to stand behind. Estimated quotes are often easier to generate with less data, making them appealing to users in a hurry, while bindable quotes typically involve more data input and time but are more “solid.”

Underwriting

Underwriting or originating the loan or insurance product typically involved applying both rules (from regulations and policies) and making some kind of risk assessment (e.g., credit risk, insurance claim risk) by predicting the likelihood of one or more “bad” outcomes using predictive analytic models. Such systems often replace manual decision-making, improving consistency, removing bias and freeing up underwriters or loan officers to focus on complex cases and the overall process.

Some forms of origination and underwriting are sufficiently complex (commercial loans and insurance, for instance) that the role of Decision Management Systems is largely in helping a human user either by making some of the component decisions within the overall decision or by at least eliminating options or choices that are not allowed in the circumstances.

Pricing

Pricing a loan or policy is sometimes a separate calculation decision managed by a Decision Management System whether or not the decision to underwrite is automated. These are typically based purely on calculation rules.

Payroll Deduction Calculation

When applicants are approved for insurance or loans there may be additional calculations that can be automated. One example is a Decision Management System to calculate appropriate payroll deductions and the tax implications of same.

How to Approve This Request

Some organizations are not interested, willing, or able to automate the decisions themselves. Even in these circumstances, Decision Management Systems can play a useful role. Organizations have built Decision Management Systems to manage the

approval process (applying regulations and restrictions on how approval is managed and who is involved), to identify the forms and proofs necessary prior to approval and more.

Even when the business decision is left to a human user, Decision Management Systems can improve throughput and efficiency. By handling decisions such as readiness (do we have all the paperwork we need), assignment and routing they can make the manual decision-making flow more quickly and efficiently.

Marketing

The use of Decision Management Systems to focus marketing efforts more effectively is becoming increasingly common as the cost of building and operating Decision Management Systems drops. Where in the past the value of each individual decision had to be quite high to justify a Decision Management System (thus fraud and risk-based decisions dominated), modern platform technologies and pre-configured Decision Management Systems can be used even when the value of each decision is very low. For instance, the difference between a good cross-sell decision and a bad one may not be very great, while the difference between a good loan origination decision and a bad one may result in thousands of dollars of losses.

Organizations focused on becoming customer-centric are increasingly turning to an approach known as next best action or next best activity (some more grammatically precise organizations talk about best next action). Such an approach involves considering every action that the organization could take towards a customer—making a cross-sell offer, collecting new information about customer preferences, reminding them to use a product they already own—and ensuring that each opportunity for interaction uses the “best” one for long term customer value. This focus on actions—not just offers—and a desire to centralize and systematically improve the selection of the best action drives a need for a Decision Management System focused on this decision. While these are not limited to marketing actions (they include service and support issues), they are typically rooted in Marketing. See also personalization below.

Targeted Marketing

Organizations are trying to ensure that their marketing is more relevant and targeted. They are dividing customers and prospects into increasingly small segments using analytics and then focusing messaging on these segments. Combining business rules and predictive analytics to target every prospect effectively, this approach to targeted marketing relies on a Decision Management System at its core. The need to replace blanket campaigns that send the same offer to everyone with something more focused drives the need for a Decision Management System.

Next Best Offer

The classic marketing Decision Management System is to calculate the next best offer for a customer. Such systems apply best practice and contact rules as well as predictive analytic models for propensity to buy to determine which of a company’s

products are most appropriate as the “next product” for a customer. This then drives promotional activity.

Cross-Sell

Related to the next best offer approach is the use of Decision Management Systems to drive cross-sell. Companies are developing these systems to suggest appropriate cross-sell offers in call centers as well as driving them into the checkout process online. Some are even using them in store locations. Improved cross-sell drives higher basket value and can improve loyalty by creating customers with more (product) connections to a company. These decisions are increasingly managed across product lines or lines of business, further increasing the value proposition of a centrally managed system.

Up-Sell

In an almost identical fashion, companies are using Decision Management Systems to identify a product from within the line of business that is more profitable or advantageous than the one the customer is currently planning to buy. These systems tend to stay within a line of business and are evolving from being rules-based to including analytics to predict what is likely to be accepted so that upsells are not made when they will simply irritate a customer.

Customer Next-Best-Action

As noted, some organizations are evolving their marketing and support systems to a next best action approach. These Decision Management Systems coordinate all possible actions (sell this additional product, encourage use of this service the customer already has, recommend this product fix or FAQ answer, ask the customer for this clarification on their data) and selects the one that is most likely to move the customer conversation along and build long term value. These systems involve business rules about who to contact and when as well as definitions of product or action eligibility while predictions of propensity to accept and of likely future profitability are at the heart of effective choices. The marketing department typically drives much of this but customer service and support must be involved also if the system is to focus on next best action.

Determine Coupon

Some businesses rely on coupons and on getting coupons (whether paper or electronic) into the hands of customers who will use them in a way that boosts a company’s bottom line. Decision Management Systems are used to determine which customers are eligible for which coupons and increasingly to focus coupon spend analytically where it is likely to have the most impact.

Personalize Offer

Marketing in some organizations is moving beyond segments and standard offers—who gets which offer—to a focus on personalization. These organizations are personalizing their interactions with customers and prospects using everything they know about a prospective customer. Moving beyond just using names and locations,

these Decision Management Systems are making a micro decision about each prospect, generating messages and contact strategies specific to that prospect. Not “which customers get this offer” but “what should we say to this customer right now.”

Change or Prevent Behavior

Some Decision Management Systems send communications designed to change behavior on the part of prospects or customers. These are not necessarily focused on offers or products but send specific information designed to provoke a short-term or long-term change in behavior. For instance, Decision Management Systems have been built to target someone to increase the likelihood they will make a bequest, to increase their loyalty, to reduce the likelihood they will churn and more. These systems use predictive analytics, to identify those most likely to make a bequest for instance, and then use the factors that drive this model to see what content or communication might influence others to do likewise. These systems can also be very real-time and responsive, responding rapidly to competitors and identifying those customers who will be impacted by a change and targeting them with content most likely to counteract that competitor’s behavior and so sustain loyalty.

Personalization

Personalization may seem like the realm of Marketing but in fact Decision Management Systems have been used to drive a wide range of personalization beyond that used in marketing offer management. These systems take what is known about a user—information about them, past history, preferences and increasingly predictions about their likely interests and future behavior—and uses this to personalize some interaction with them. These Decision Management Systems replace one size fits no-one interactions with intensely targeted interactions, allowing users to feel that they are “known” and helping navigate increasingly large pools of information.

Determine Relevance of Content

As organizations try to help users navigate huge volumes of content, Decision Management Systems are increasingly being used to decide what content is relevant to a particular user. Such systems are often necessary as traditional agents or intermediaries are no longer available. In travel, for instance, travel agents used to act as a filter on content for travelers. Now, with more people booking online, a Decision Management System is needed to provide that same filtering as otherwise there is simply an overwhelming amount of information to review.

Customize Advice

While there is a lot of generic content available today, consumers increasingly look for advice customized to them. By applying expert rules and analytics, Decision Management Systems can be used to customize the advice being given. For instance, when giving people weight loss or pain management advice, the results of

a questionnaire can drive sophisticated rules and analytics based on medical best practices and research to produce advice that is tailored, specified and relevant.

Configure Offer, Product, or Service

In similar fashion, some organizations are using Decision Management Systems to configure offers, products or services. Whether computers that are assembled from a wide variety of parts, trucks that can be ordered to meet personal needs or vacation packages, it is often a non-trivial exercise to determine that a particular configuration is allowed or buildable. Decision Management Systems are used to suggest configurations, to match configurations to stated goals and to confirm a custom configuration.

Optimal Price for This Customer

As dynamic pricing has become more common, determining the optimal price for a specific customer has likewise become more common. Using a Decision Management System to correctly price a product or service for a specific customer based not only on their needs and on configuration but the value they will place on the product and potentially their ability to pay allow companies to maximize the value of their sales. As more data and more sophisticated systems become available, this is focusing on individual customers not just customer segments for truly personalized pricing.

Collections

Collections, chasing down those who owe money to the organization and collecting it, is a complex problem. Traditionally handled with large teams of people "dialing for dollars" and a first-in, first-out or highest dollar value approach to prioritization, collections can be made dramatically more effective using Decision Management Systems. See also personalization above.

Next Best Action

Some forward-looking organizations are using Decision Management Systems to assign collections agents to work dynamically. Instead of having each agent work through their own queue, these systems dynamically prioritize the available collections work and assign it to agents as they become available. Using everything known about the overdue payment, predictions of the likelihood that someone will pay and even the skills of the collection agent, these systems determine the next best collection action.

There is a general move toward "next best action" systems across the board. Whether it is actions for customers, actions for collections agents, audits, or quality reviews, focusing limited resources on the next best action adds value when it replaces traditional, first-in/first-out systems.

How to Handle Non-Payment

Even when using standard queuing and assignment systems, collections organizations can benefit from Decision Management Systems. In particular, the use

of business rules and predictive analytics to determine the most appropriate way to handle non-payment situations is effective at reducing unnecessary calls and increasing collection rates. By identifying those most likely to simply have forgotten and prioritizing a simple reminder, by predicting the amount someone can pay and the likelihood they will stick to a commitment, as well as by ensuring consistent application of collections policy, Decision Management Systems can dramatically improve the way non-payment situations are handled.

Government Operations

While many of the scenarios identified as candidates for Decision Management Systems are commercial, government operations can also use them to improve the effectiveness and efficiency of public sector organizations. More heavily focused on the use of business rules to enforce regulations and associated policy, public sector Decision Management Systems can improve consistency, provide enhanced self-service for citizens, and demonstrate compliance. The growing use of predictive analytics in these systems can also help target constrained government resources where they will do the most good.

Benefit Eligibility

Perhaps the most common Decision Management System in public sector, the use of a rules-based system to determine who is, and who is not, eligible for a benefit or service has clear benefits. Not only is the system consistent, always applying the same rules, it is available 24x7, improving access for all. Such a system can also be readily changed when regulations change or even when court cases demand exceptions or updates.

Benefit Calculations

Related to eligibility is the calculation of benefits. While some benefits are straightforward to calculate, others can be very complex. When multiple factors must be considered, complex questionnaires processed and tax returns consulted to determine the correct value of a benefit, a Decision Management System can dramatically improve both response time and accuracy.

Tax or Fee Calculations

Government agencies must often make complex calculations of taxes or fees (such as vehicle license fees or business registration fees) owed. These calculations can get complex and, perhaps even more importantly, are much more prone to change than the systems and processes of which they are part. By separating out the calculation as a Decision Management System, an agency can create a stable process, for registering cars or handling tax returns, while retaining the ability to make rapid and effective changes to the calculation.

Permits or Other Paperwork Needed

One of the most frustrating processes for citizens is often determining which permits or paperwork is needed for a particular activity—to modify a house for

instance or apply for a grant. Using a Decision Management System to help citizens navigate these kinds of decisions reduces their frustration and allows limited resources to be applied to solving problems not discussing paperwork. Putting the decision first—deciding what paperwork is required and then processing it—can also dramatically simplify the processes involved.

Submission Completeness and Approval

As government agencies have developed online interfaces for forms, allowing citizens to submit paperwork electronically, they have created the opportunity for new uses of Decision Management Systems. If a form can be submitted electronically then a Decision Management System can be used to check that it is complete. It can also do so intelligently, using data entered in one part of the form to make sure that other parts are filled out correctly—moving far beyond simply mandatory fields or defined ranges for values. Predictive analytics can be added to flag potential fraud where appropriate, allowing the automatic processing of complete, low-risk applications and manual review of others.

Audit Selection

Many government departments must decide whom to audit. These audits often uncover unpaid taxes, fraud, or abuse. Yet the groups that conduct these audits are constrained by budgets and headcount limits in ways that mean that not all potentially useful audits can be conducted. A Decision Management System can use expert rules as well as predictive analytics to prioritize the most potentially valuable audits and do so with transparency—the rules being applied will be clear so there is no chance of bias or favoritism. Some organizations have even gone to a “next best audit” approach, dynamically assigning auditors to investigations as they become available.

Targeting Resources

Another use of Decision Management Systems to maximize the value of resources comes in targeting scarce resources where they will do the most good. Police forces can assign patrol cars or beat offices to neighborhoods, educational authorities can assign advisors to at-risk students, and social services can assign caseworkers using Decision Management Systems. These can apply not just policy and best practices but also predictions of risk (e.g., likelihood of crime, dropping out of high school) and of the most effective intervention to maximize the value of resources in terms of overall results.

Identify Fraud, Waste, and Abuse

Finally, there are many ways to use Decision Management Systems to identify fraud, waste and abuse. This includes identifying fraudulent tax returns, providers who are inefficient users of government grants and even of people making unnecessary emergency calls. By flagging these transactions and individuals, Decision Management Systems focus government budgets where they will help most, reducing the cost of a given level of service. See also fraud detection above.

Supply Chain Management

Decision Management Systems are just beginning to penetrate supply chain management. There is tremendous potential for Decision Management Systems in this area, particularly as organizations look for ways to bring predictive analytics to bear on their supply chain. By focusing predictive analytics on specific orders or shipments, Decision Management Systems make it possible to effectively apply more advanced analytics even in very complex supply chains. Many examples exist despite a low overall penetration rate.

Eligible Supplier

One of the most basic use cases for Decision Management Systems in the supply chain is that of determining eligible suppliers. For organizations with large numbers of suppliers, especially for those where commodity products are sourced from many competing suppliers, the automated determination of eligible suppliers can be a big time and cost saver. Allowing organizations to determine for themselves if they could become a supplier and allowing each country or product line to add its own additional criteria for eligibility are additional reasons for using a rules-based approach to determine eligibility in a flexible way.

Best Supplier Selection

While supplier eligibility can be made more efficient using a Decision Management System, it is also possible to become more effective in the use of suppliers by automating the selection of the most appropriate for a given order. Using both eligibility rules and predictive analytics that show the likelihood of on-time and to-specification deliveries for example can create a system that automatically selects suppliers based on the right balance of cost, speed, and quality given the circumstances of the order. Such systems improve straight through processing, reducing the need for human involvement in increasingly complex supply chains.

Routing and Shipping Selection

As supply chains become more complex and distributed, it is also increasingly hard to know how to route a delivery or what shipping mechanism to use. When those shipping the order are not those paying for it, as is often the case when many small manufacturers are tied into a global supply chain, real-time determination of the right thing to do is essential. A Decision Management System can apply best practices, policy, short-term deals offered by shippers, current traffic problems and more to come up with the best shipping option and the best routing, reducing costs throughout the supply chain.

Reorder Levels and Alerting

While many supply chain systems have automated thresholds for re-ordering or for alerting a user that stock is low, these are often simplistic. The reality of a modern supply chain is that the amount of stock, and where that stock should be, is highly variable. It can depend on the season, on trends in sales, on competitive behavior, on marketing campaigns and much more. Using a Decision Management System

allows multiple sources of rules to be applied to the decision, allows the integration of predictions and forecasts, and supports short-term adjustments and “tweaks” as necessary.

Asset Management

Many organizations must use assets, fixed plant for instance, as effectively as possible if they are to operate profitably. The use of a Decision Management System to improve decisions about such assets is still relatively unusual but there is a growing set of examples. Particularly as more equipment is instrumented and connected to a network, the value of a Decision Management System for making targeted decisions specific to each asset is rising.

Service Needs

One of the most basic uses for a Decision Management System is the identification of service needs. Today most assets are serviced on a fixed basis. However, as usage data is collected for a specific machine or piece of equipment it becomes possible to calculate unique service needs for that piece of equipment. Thus, a tractor being driven more aggressively, though traveling the same number of miles and the same age as another, will be identified as needing service more often. This keeps equipment “healthy” longer while also eliminating unnecessary services.

Validate Usage

This same increased instrumentation is driving remote monitoring and advice to new levels. When a piece of equipment is constantly monitoring its own usage and logging this information, a Decision Management System can be used to check that the usage is appropriate. For instance, if heavy equipment is being left idling too much during a particular shift or if a particular operator is heavy handed in some way, this can be flagged and remedial actions suggested. This uses a Decision Management System to provide supervision through the remote logging. Service needs and potential failures can also be flagged and alerts issued.

Preventative Maintenance

Failures and problems with expensive assets can result in extensive, and costly, downtime. The ideal for many organizations is to fix things before they become critical to minimize the risk of such downtime. Decision Management Systems can use predictive analytics to identify assets at risk of failure and then use rules to assign an engineer’s spare time to check the asset or extend a scheduled visit to proactively fix something early.

Proactive Use of Asset

If assets are not in continuous usage then there is a potential opportunity to use the asset for some other activity during its “down time.” Deciding what to do with otherwise idle assets is increasingly something that can be automated using a Decision Management System based on the prediction of the likely value of the various possible actions.

Manufacturing

Manufacturing is another area where Decision Management Systems are being introduced. Many manufacturing operations are large scale with huge numbers of potential decisions to be made. As customers demand more customized products, organizations must also customize at scale. This means that tasks and work allocations that used to be identical across production runs must be customized and tweaked for different customers or batches. Decision Management Systems offer a new level of control. See also process efficiency below.

What to Make

One of the most basic decisions is that of what to make. When an organization manufactures for stock, rather than specifically for an order, it must constantly choose what to make and what not to make, what colors to pick, what packaging sizes to use and so on. A Decision Management System can use predictions and forecasts, current stock levels and more to decide what is most appropriate to make at any given moment.

Allocation and Configuration of Machines

Especially in complex manufacturing situations, the allocation of work to a machine and the configuration of that work stream can be critical to the overall effectiveness of the line. Many machines might be capable, if configured correctly, of handling specific tasks and specific tasks might be assignable to many machines. Decision Management Systems can handle the complexity of this kind of situation, applying the rules that determine which machines can do what and combining them with predictions and even optimization to ensure maximized results.

Reducing Manufacturing Problems

In complex manufacturing scenarios, there is a constant risk that problems might be introduced to the finished product. The wrong part may be used, something may be damaged by the production process, or a task may take an unexpectedly long time. Using Decision Management Systems can reduce these problems. Systems can assign quality improvement actions to the QA team, replacing fixed checklists with dynamic “next best check” systems while also assigning supervisory and training resources for proactive mitigation of potential problems. Predictions of risk, rules about skill levels required and certifications, and much more can be used to drive increasingly sophisticated decision-making on the production floor.

GRC

Governance, Risk and Compliance is a broad topic that is a serious area of focus in many regulated industries. Ensuring that everything is done according the regulations, enforcing and managing a governance environment, and tracking and accounting for all appropriate risks can be a daunting task. Attempting to do all this manually is prohibitively expensive. Decision Management Systems provide the advantage organizations need to effectively manage their GRC approach.

Data Management

When it comes to data regulations can prescribe what data should be stored, what cannot be stored, what must be anonymized and much more. Who can access the data, under what conditions and with what degree of supervision may all be spelled out. Reporting can be specified too, documenting what must be reported to whom and by when. All of this data management can be enforced and managed with a Decision Management System, avoiding fines and reducing overhead. Using rules to automatically manage all the explicit guidance and integrating analytics to help with detecting identify fraud makes keeping data safe, secure and appropriately available practical. Unlike manual processes, Decision Management Systems scale up quickly and respond in real-time as data flows through your systems.

Authorization

Another significant issue in GRC is who can approve who and what. Preventing people from (even indirectly) approving their own expenses, trades or data access is important and increasingly complex in matrixed organizations. Again identify theft prevention is critical if authorization schemes are to be robust and believable. Ensuring that a single coordinated set of business rules drives authorization across multiple systems is a great role for a Decision Management System.

Alerting

If, despite everything, things go wrong, GRC systems need to alert the right people, give them the right information, and do so quickly enough to avoid additional fines and problems that can result from delay. Rather than pushing dumb alerts to someone's desktop (and hoping they respond), a Decision Management System can act automatically and work its way through the right set of escalations and notifications, even when this chain of events is complex and changes often.

Healthcare

Healthcare is an industry increasingly rich in data. Yet simply applying analytics, doing simply what the data tells you, is not practical in an industry where peer review, published best practices, and government regulation abound. Decision Management Systems, with their combination of rules and analytics, are ideal for this environment. As more of the healthcare industry is computerized and more data is collected, Decision Management Systems are playing an increasingly important role. As healthcare goes mobile, helping patients live at home and treat themselves, this is only going to increase.

Identify Drug Interactions and Other Issues

One of the most common uses of Decision Management Systems in healthcare is to identify potential problems in prescriptions. Identifying potential drug interactions and checking dosages prescribed against patient details involves large numbers of rules gathered from best practices, medical research, drug companies and more. Providing these checks in the hospital as nurses administer drugs, at the pharmacy

as prescriptions are fulfilled, and warning doctors about potential issues can all be driven from the same rules ensuring consistency and reach.

Determine Treatment

The best practice in healthcare evolves continuously. New therapies, new suggestions, new drugs, and new ways to match a patient to a therapy, using genetic matching for instance, make it hard for medical professionals to stay up on the latest treatment. Especially when multiple possible treatments can be proposed, selecting the one most likely to work for a particular patient—personalized medicine—is complex. Decision Management Systems engage medical professionals in managing their own rules, bring analytics to bear as data is gathered regarding what works, and easily stay current as best practices and guidelines change.

Target At-Risk People

While we might wish we could always apply all the resources that might help to a medical problem, the reality is that we cannot. Determining which patients are most at risk and what kinds of interventions are likely to have the biggest impact is a fact of life for most healthcare organizations. Using analytics, especially predictive analytics, as well as expert rules and best practices, a Decision Management System can ensure resources are applied effectively to those most at risk.

Scheduling

Healthcare, like many labor-intensive industries, involves complex schedules. Making sure that the relevant specialties are available at the right time and place, managing staffing to match demand, ensuring that operating rooms are prepped before they are needed—all this makes scheduling in healthcare difficult. Decision Management Systems can use rules and optimization to come up with the most effective schedules possible, given the constraints, saving money and lives at the same time.

Process Efficiency

To wrap up this discussion of use cases, some very generic examples. Many industries share common problems that can be lumped into a focus on process efficiency and effectiveness. Decision Management Systems, by handling critical decisions in those processes, can make a big difference on both counts. Some examples follow.

Validation

Has enough information been entered? Does it match other information available and is it internally consistent? This kind of rules-based validation is common to many processes and using a Decision Management System to automate this check speeds processing and reduces manual overhead.

Completeness and Readiness

Many processes have steps that are more expensive, such as conducting an inspection or writing a contract. By automating a check to see if the process is ready to go to the next step—do we have all the information needed to effectively inspect this ship or building, to put a contract together for this deal or annuity—Decision Management Systems ensure that processes only move on when it makes sense to do so.

Plausibility

An interesting variation comes in situations where only a human can really tell if something is true or not, such as a customs declaration. A Decision Management System might use rules and analytics to determine how plausible such a declaration is, helping focus limited resources where they will do the most good.

Assignment or Allocation

Many processes involve assignments and allocations: decisions about who to make responsible, how to allocate the work involved, and who should do what. When processing speed is important, or when consistency and traceability are a must, a Decision Management System can provide rapid, agile, compliant processing.

Sequencing and Adaptive Case Management

Many processes are increasingly modeled using a more adaptive approach. Instead of laying out all the steps and branches, different clusters or groups of tasks are identified that may need to be handled for a particular transaction or case. Deciding which need to be included, and when, is a task ideally handled by a Decision Management System that is monitoring the case and constantly evaluating the most appropriate and necessary steps for the case.

Dynamic Forms

Collecting data from people is a constant challenge. While sometimes a simple form or a form with a few options works well, sometimes it is very difficult for a user to determine what data is required. Each question they answer drives the need to answer, or not answer, subsequent questions. This kind of dynamic questioning is another good user case for Decision Management Systems.

Dynamic Checklists

Checklists are a powerful tool for improving the effectiveness of staff members. But to work a checklist must be very specific. Trying to handle even a small number of situations with a single checklist can make for complex checklists with lots of navigational instructions to make sure the right items are checked at the right times. Instead a Decision Management System can be used to drive dynamic checklist. Very specific checklists generated for each circumstance. All the checks needed for that circumstance but only the ones needed.

Big Data

Big Data is more than a buzzword; it is the in volume, velocity, and variety: more data, of more types, arriving more quickly. Simple analytics are not enough; decision management systems increasingly are becoming required to handle the ever-growing, ever-changing processing and analytical needs of Big Data.

Automating Decisions

The sheer volume associated with Big Data lends itself well to automating decisions. Organizations can set up Decision Management Systems to parse large amounts of data quickly, setting up processes balance recency versus long-term trends and avoid many of the data interpretation problems that beset human decision-makers.

Industrializing Analytics

More data means more analytic models are required, and these models need to be built more efficiently. Automation and technology to build the models, including machine learning, fully automated modeling capabilities, or automation added to tools for data for data scientists, can help achieve this goal. Additionally, organizations can apply the latest in in-memory and in-database technologies to decrease the time to create models.

Analyzing a Variety of Data Sources

The explosion of social, mobile, local, and cloud data means organizations need to first model decisions that impact the business, then pull in this data for analysis and delivery. The various sources can be analyzed efficiently with Decision Management Systems, once the organization broadens its definition of data infrastructure to include formats like Hadoop. Then, operational systems can improve text analytics and entity analytics skills to identify what is discussed in unstructured data sources. For example, an analytics model built for Big Data captures the sentiment of an email, such as the type of product being discussed, and feeds it into the Decision Management System.

Analyzing Data Quickly in Real-Time

As more data arrives more quickly, organizations need to deal with velocity faster and while it is in motion. There is less time to decide, so the value of predictive analytics cannot be understated. The further out an organization can see, the more time it has to respond. Additionally, organizations need to inject the decision-making into streaming data, packaging business rules and analytics and injecting them into a data stream to enrich the stream with decision answers or run parallel processes as the stream flows by. The growing ability of business rules management systems to integrate with event handling and the deployment of analytic models into streaming data infrastructures are just two of the developments supporting this trend.

Suitable Operational Decisions

Besides these specific use cases, there are some key characteristics of decisions that make them suitable for automation using Decision Management Systems. These are discussed more fully in the book, but suitable decisions have four characteristics:

Repeatable

If a decision is not made in a repeatable way and made regularly it will not be possible to automate it nor to show a return on doing so.

Non-trivial

A decision must have a degree of complexity to make it worth the investment in additional capabilities discussed above. There must be policies or regulations that drive and control the decision, a degree of expertise involved in making it well or some analysis of information required.

Measurable business impact

It must be possible to tell what the business impact of improving the decision will be, and even what a good decision is relative to a bad one. If the value of improvement cannot be described or worse yet the value of a decision cannot be measured at all then it will not be possible to show the value of a Decision Management System.

Suitable for automation

Every organization has a different attitude to automation. Unless the organization is willing to consider a system to make the decision there is no point in building a Decision Management System. A decision that must be taken by a person might involve dependent decisions that are suitable candidates for automation but building a Decision Management System to automate a decision that an organization believes should be taken by a person will result in a system that does not get used.

Suitable decisions often break down into rules-centric decisions such as eligibility, validation and calculation and analytic-centric decisions such as those relating to risk, fraud and opportunity.

Next Section: Best Practices in Decision Management Systems

Decision Management Systems operate with four key principles, and within those, there are specific best practices to be considered. In this section of the Report, we'll delve into these best practices in detail, helping you to improve business performance and get the most ROI from your investments.

There are four key principles of Decision Management Systems:

- ▶ Begin with the decision in mind.
- ▶ Be transparent and agile.
- ▶ Be predictive not reactive.
- ▶ Test, learn and continually improve.

Within each of these principles, we have identified three to four specific best practices in analysis and design, development, deployment, and operations.

The next section outlines these Best Practices based on our extensive experience helping clients build successful Decision Management Systems.

Continuing reading [The Decision Management Systems Platform Technologies Report](#)

Learn More

We have extensive experience helping organizations like yours define, configure and implement Decision Management Systems that deliver on the value propositions described in this Report. Our clients are leading companies in insurance, banking, manufacturing, telecommunications, travel and leisure, health management, and retail.

- ▶ [Client Case Studies](#)
- ▶ [Our Services](#)

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About The Decision Management Systems Platform Technologies Report

This report is focused on platform technologies used to build custom Decision Management Systems and our goal is to be comprehensive within this scope. Many vendors have developed powerful pre-configured Decision Management Systems focused on solving specific decision problems such as loan underwriting, claims handling or cross-channel marketing. For many organizations these solutions are ideal but they are not the focus of this report. Similarly, there are vendors that build custom Decision Management Systems for their customers and that have developed powerful platforms for doing so. If such a platform is not for sale to those building their own solutions, then it is out of scope for this report.

In both these scenarios the report's discussions of what kinds of functionality is useful, best practices and characteristics for suitable products may well be useful in the selection of vendors but some interpretation will be necessary.

Vendors and products in scope for the report are added continually. First Looks are also posted to www.JTonEDM.com as they are completed. Each new version of the report will be made available at decisionmanagementsolutions.com/decision-management-platform-technology/.

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