



Decision Management Systems Platform Technologies Report

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Experience in working with organizations building Decision Management Systems shows that while there are many ways to develop them effectively, certain key product characteristics come up repeatedly as critically important.

This set of characteristics is neither a definition of a complete set of features and functions required to build a Decision Management System nor a complete list of characteristics for any of the product categories. It is intended as a set of characteristics you can look for in products you are purchasing or using that will support a focus on Decision Management Systems.

The key characteristics are:

- ▶ Platform Completeness
- ▶ Business User Engagement
- ▶ Architectural Flexibility
- ▶ Decision Monitoring
- ▶ Performance and Scalability
- ▶ Organizational Scale.

Each Decision Management System requires different subsets of the capabilities described above. The right set of vendors and products is going to vary, depending on the requirements and needs of both the project and the organization as a whole.

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 Predictive Analytics*
 - 4.3. *Optimizing and Simulating Decisions*
 - 4.4. *Monitoring 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 |

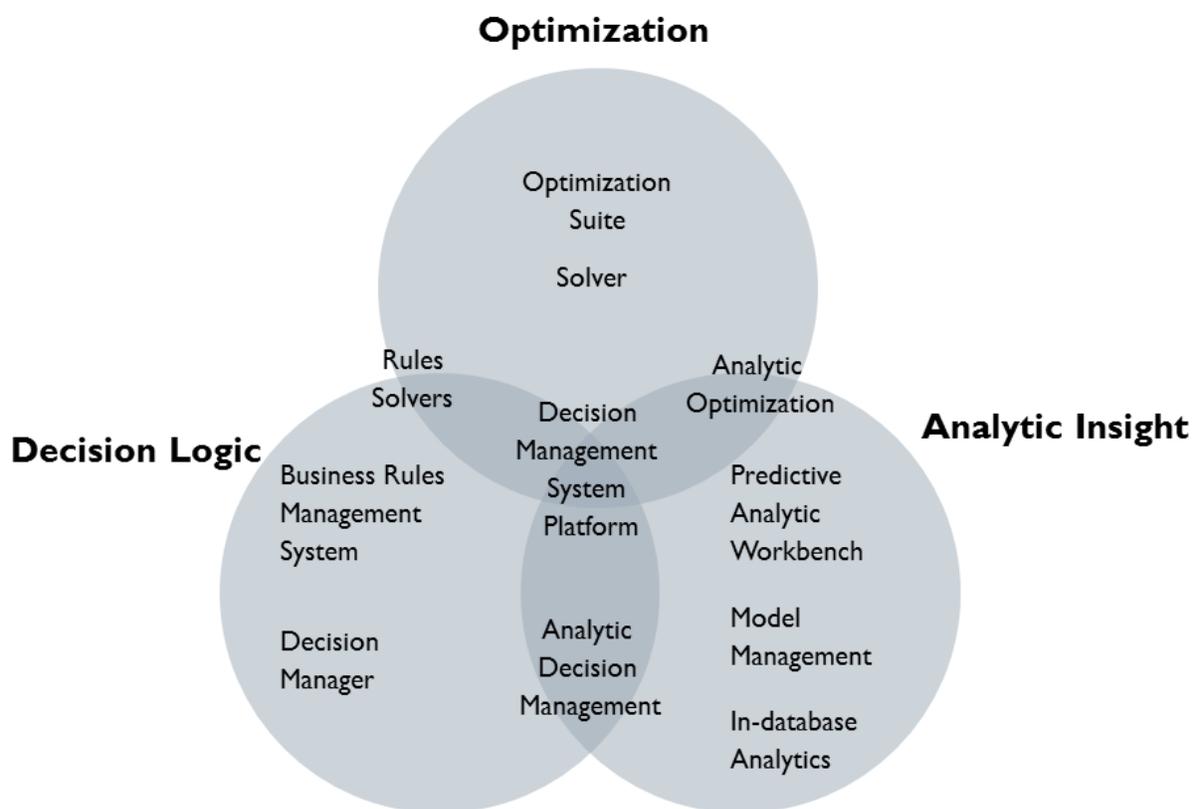
Technical readers are recommended to read the five Key Capabilities documents (*Managing Decision Logic with Business Rules*, *Embedding Predictive Analytics*, *Optimizing and Simulating Decisions*, *Monitoring Decisions* and *Modeling Decisions*) to better understand the component technologies of Decision 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**.

Product Categories

Multiple product categories exist in the market for decision logic management, predictive analytic modeling, optimization, and simulation. As Figure 1 shows, these product categories often overlap.

Figure 1. Overlapping Product Categories



While there are many Business Rules Management Systems that just manage decision logic, there are also products that combine the management of decision logic with optimization or with building predictive analytic models. There are also products that are called Decision Managers or Business Decision Management Systems that manage decision logic and other Decision Management products that manage decision logic and build predictive analytic models. Some Predictive Analytic Workbenches include in-database scoring capabilities, some package this separately while model monitoring and tuning is similarly sometimes packaged separately.

Navigating Products for Managing Decision Logic

When considering products for managing decision logic, there are two main areas of potential confusion—is decision logic the primary focus and is the product rules-centric or decision-centric?

Decision logic as a primary focus.

The first is the degree to which the product is explicitly focused on managing all the logic for a potentially complex decision rather than managing some decision logic so that it can be combined with some analytic insight. For instance, a number of products focused primarily on building and deploying analytic models also allow you to manage some business rules. These are typically either focused on eligibility or cut-offs. Eligibility rules might select a subset of all possible records in a set before applying analytic models to them or determine that only certain outcomes are allowed for a given record regardless of what the model may predict. Cut off rules generally turn predictive scores into simple actions based on clearly defined values.

Such capabilities are much to be desired in analytic products but they will not allow an organization to manage the number of business rules involved, for instance, in complex eligibility decisions. Because they assume that analytics are at the core of a decision they are also not they likely to be effective if used to manage decision logic for decisions driven entirely by policy, regulation and best practice that therefore have no analytic component. For these decisions a product that is either primarily focused on decision logic or that regards explicit logic and analytic insight as peers in decision-making will be more appropriate. Such products are more likely to be referred to as a Business Rules Management System or a Decision Manager. Some Decision Management platforms treat the two as peers while products focused on Analytical Decision Management are more likely to be focused first and foremost on analytics.

Rules-centric or decision-centric.

The second is a more nuanced consideration. Some products for managing decision logic began as expert systems or focused on the management of business rules. While users of these systems always used them to automate decisions, this was often implicit in the deployment of the rules rather than explicit in the design. Other products have begun with a focus on business process and added business rules capability and similarly evolved towards a more decision-centric focus. Such products used to refer to themselves as business rules engines then as Business Rules Management Systems and now, increasingly, as Decision Management products.

In contrast, other tools have begun with an explicit focus on decisions. These typically allow a decision to be documented as such, including its inputs and outputs, before the logic of the decision is specified to fill the gap between inputs and outputs. These have always used “decision” in their names and are often called

Decision Managers or use Decision Management in their names. Some, from companies with a strong analytic focus, might refer to Decision Analytics also.

This focus can be just a naming thing, with equivalent products having different names, but it can also reflect a subtle yet important emphasis on decisions over business rules as the primary organizing principle of a product.

Navigating Products for Developing Analytic Insight

In many ways the products that offer support for the development of analytic insight are more straightforward. Most such products are described either as Data Mining Workbenches or Predictive Analytic Workbenches. Increasing Data Science appears in their name also. These are often easy to compare with each other and offer broadly comparable capabilities. Some such products are narrowly focused, offering a small number of analytic algorithms or support for a particular kind of data. More common are workbenches that support a wide range of such techniques and data sources.

The only areas of potential confusion come in the support of model management and in-database analytics and the potential support of some general purpose decision management platforms for limited development of analytic insight.

Model management.

Some analytic products include capabilities for model management in the same product that is used to build analytic models, some package it up as a separate capability. There is also a small group of products designed explicitly for model management. There is no particular advantage or disadvantage to the approaches though having a more web-based and less analytic professional-oriented environment for model management can be appealing. Some of these model management capabilities support models built using a variety of analytic tools. This support for monitoring and managing models that were built using multiple tools is a significant differentiator, regardless of whether it is packaged with an ability to build models or not.

In-database analytics.

Similarly, some analytic workbenches package up support for in-database analytics (either development or deployment or both) with the workbench while others sell it as a separate capability. When considering a workbench from a functional perspective, what matters is the tool's support for the databases in use at your organization and the depth of integration. Packaging may affect pricing but it generally does not affect capability.

Decision-centric analytics.

Some products that are primarily focused on managing decision logic provide capabilities for developing analytic insight. Some offer what can be described as “data mining for business rules,” allowing data mining algorithms that produce decision trees or association rules to be used within the tool to find suitable rules

from historical data. Some offer data mining algorithms integrated with a decision tree editor for “data-driven strategy design”. Both such capabilities are highly desirable and the use of data mining to find business rules is a clear best practice (discussed in the section on analytic and it cooperation). Nevertheless, these tools do not offer the same range of analytic insight capabilities as a specialist tool.

Some of these platforms go a little further and offer automated analytic model building capabilities also. These start to compete more directly with pure-play analytic workbenches, especially for organizations focused on decisions outside of regulated credit industries that are comfortable with automated modeling approaches. Most users of these tools will still find at least occasional reasons to use a pure play analytic workbench however.

Navigating Products for Optimization

The big differences between optimization products are a solution focus versus a tool focus and the degree of tooling available.

Solution or tool focus.

Because optimization can be complex to configure and use, many organizations adopt optimization technology as part of a solution. In this approach, the optimization model is pre-configured with integrated reporting and simulation interfaces focused on the solution. These might address a scheduling problem, supply chain issues, or product configuration. In contrast, a tool focus means delivering an optimization product that can be used to solve any problem but that must be configured before it does anything.

Because many of the pre-configured solutions are provided built on a specific tool, organizations can often begin with a pre-configured solution and then expand usage by also acquiring the underlying tool. For some organizations, however, there is only one problem that seems to justify optimization and they are likely to be happy with a single solution-focused offering

Solver or workbench.

Some optimization products are really just a set of solvers with well-defined APIs while others offer a complete workbench with debugging tools and graphical interfaces. The solver-only approach allows the tool developer to focus on performance and scalability while supporting practitioners who want to use a particular problem definition language or editing environment. A more complete workbench tends to be more supportive of less technical users and to involve less work to set up at the expense of being somewhat more limited in terms of how a practitioner can approach defining the problem.

Key Characteristics

Experience in working with organizations that are developing Decision Management Systems shows that while there are many ways to develop them effectively, certain key characteristics come up repeatedly as critically important. These characteristics fall into a number of areas including the completeness of the platform, engagement of business users, architectural flexibility, organizational scale, and decision monitoring.

This set of characteristics is neither a definition of a complete set of features and functions required to build a Decision Management System nor a complete list of characteristics for any of the product categories. It is intended as a set of characteristics you can look for in products you are purchasing or using that will support a focus on Decision Management Systems.

The key characteristics of platforms are:

- ▶ Platform Completeness
- ▶ Business User Engagement
- ▶ Architectural Flexibility
- ▶ Decision Monitoring
- ▶ Performance and Scalability
- ▶ Organizational Scale

Platform Completeness

A small number of vendors offer a complete platform for building Decision Management Systems. These platforms handle decision logic or business rules, support data mining and predictive analytic modeling, include constraint-based optimization and provide monitoring and integration capabilities for deployed systems. While it is not necessary to buy a complete platform from a single vendor, it is valuable for products to see themselves as part of a broader ecosystem. For instance, Business Rules Management Systems that are “aware” of predictive analytics and offer integration with such systems and predictive analytic workbenches that offer business rules-friendly deployment options are more suitable for Decision Management Systems than more narrowly focused products.

Complete Platform

A complete platform is an integrated set of offerings that allow for the management of decision logic, the building and deployment of predictive analytic models, and the mathematical optimization of decisions. These offerings are either a single product or a product set with a common user interface, shared repository and common tooling that operates across the products. Support for decision

monitoring and analysis is provided or the data is made available to standard reporting and dashboard components.

Complete Ecosystem

A company may not offer a complete platform for Decision Management Systems themselves while still supporting a complete platform through their ecosystem. By supporting open standards such as PMML and by partnering with other vendors that offer more pieces of the puzzle, vendors can offer a Complete Platform Ecosystem.

Openness

Some companies are not focused on Decision Management Systems but on providing a specific component. They may be focused only on managing decision logic, building predictive analytic models or constraint based optimization. They may not even think of themselves as participants in the development of Decision Management Systems. These companies are not likely to have a complete platform nor are they likely to actively partner to develop a complete platform ecosystem. Their products can still be easy to integrate and use alongside other products and can support standards such as PMML for predictive analytic models or JSR-331 for constraint-based optimization. For standalone products focused on a specific technology market this kind of openness is critical in being part of a complete platform for Decision Management Systems.

Business User Engagement

The agility and adaptability of Decision Management Systems crucially relies on the engagement of business users. The extent to which products being used to build these systems can bring business users into the development team is therefore critical. Products that focus on allowing business users to read and write decision logic, participate actively in building or reviewing analytic models and allow non-technical users to run through scenarios are more likely to be successful than those focused only on technical developers.

Business User Analytic Modeling

Analytic tools can engage business users by providing an environment designed for non-technical users to create and use analytic models. This might be a complete environment that uses automation and machine learning algorithms to build predictive analytic models with minimal data mining expertise required. Such use of machine learning algorithms and automation should be complemented by user interfaces, reporting and automated checks designed to support a less knowledgeable user. These additional capabilities can ensure that problems such as overfitting are avoided and that test and validation data is automatically set aside, for instance.

Alternatively, a product might be a business user friendly environment layered on top of a more typical data mining/predictive analytic workbench. This would use wizards and other simplifying features to make it possible for non-technical users to

do data mining and create predictive analytic models. Generally, these environments integrate with the more traditional modeling environment and store models in the same repository such that modeling specialists can refine or enhance the models built using these less technical interfaces.

Business User Rule Management

The management of decision logic by non-technical users, non-programmers, is a key element in delivering the agility required of a Decision Management System. While any product focused on managing business rules or decision logic might be said to allow some business user rule management, true business user rule management requires a number of elements.

First, the rules themselves must be approachable. Using declarative statements in place of procedural code so that each rule can be considered and edited independently, as well as the use of a business user vocabulary not technical data element names in rules, will ensure readability and clarity. Supporting a verbose, readable syntax in near natural language rather than terse programmer-centric constructs helps as does emphasizing graphical editing of rules in decision tables, rule sheets, decision trees, decision graphs and decision flows so that as little as possible has to be written out “longhand.”

Because business users are not programmers, testing tools need to be accessible to them and excellent completeness and correctness checks are essential. Ideally, these tests are performed inline, as business rules are edited, to ensure that obvious mistakes and omissions are avoided.

Business users do not like technical environments designed for programmers so support for the editing of business rules outside these environments through a web interface or a point and click, business friendly editing environment makes rules more accessible. Such editing environments might include support for editing using standard Microsoft Office products also. Ideally, these editors will be embeddable or mashable so that rule management can be embedded in environments focused on a specific business task rather than on rule editing.

Support for a Learning Curve

Most organizations will not be able to jump straight to either business user analytic modeling or business user rule management. They will need to bring business analysts on board first, exposing some of the tasks previously performed by IT or analytic teams to these semi-technical users. Over time, the role of business analysts can be expanded and true business users brought in to work on certain elements. Products that provide way stations and gradual increases in complexity through multiple editing environments will be easier to adopt than those with a more limited set of options.

For example, a product that allows users to bring analytics to bear incrementally rather than all at once will improve analytic adoption. If simple interfaces allow access to candidate association rules and proposed splits in decision trees then

users will become gradually accustomed to the power of analytics to improve their decision logic. Over time, they can be exposed to completely data-driven decision trees, unsupervised clustering, and ultimately more complex predictive analytic models. Similarly, a variety of rule editors that allow a user only to change numeric values in a locked-down rule can get users used to the idea that they can change decision logic. Over time, editors that allow new rules to be built based on templates and perhaps new rules to be built using a point and click editor can bring users up the learning curve gradually.

Impact Analysis

One of the biggest barriers to business users taking ownership of their decision logic, in fact probably the biggest single one, is an inability to see what the impact of a change will be. Products that provide strong impact analysis tools, especially tools that allow a non-technical user to see how the change they are considering will impact their business results, will be more able to drive successful business user engagement.

Impact analysis can be done using functions designed for regression or performance testing. The ability to do impact analysis and simulation using real data in a business friendly way is invaluable, however. This involves simple to use interfaces for loading data, an ability to assign business value to different outcomes, and generally the ability to get results into Excel for further analysis. Ideally, the environment should continuously perform impact analysis as changes are being made so that all edits are made in the context of their business impact.

Impact on Application Context

Simulating the impact of a change on the application or process context in which the decision is being made is sometimes critical. For instance, the impact of a change to fraud detection decisions may be best considered in terms of the workload create for fraud investigators and the average handle time for fraud cases. These measures are not measures of the decision performance alone but include process / application design issues. An ability to determine the broader business impact of specific changes made to decision-making is a potentially very powerful capability.

It may seem that this requires the application or process context and decision-making technologies to share a vendor. Certainly, this capability is easier to provide in those circumstances but most organizations will ultimately find themselves in a more heterogeneous environment as noted above, so more flexible capabilities that allow decision simulation to be integrated with simulation capabilities from other tools should be valued as well as more packaged capabilities.

Architectural Flexibility

Decision Management Systems automate decisions that must often be used in multiple channels where these channels may be supported by different applications and architectural approaches. Decisions may need to be made as part of business

processes, in response to events detected or in support of legacy environments. A degree of architectural flexibility is therefore very useful in products used to develop Decision Management Systems. Support for multiple platforms and deployment styles as well as a wide range of integration options helps a lot.

Cloud Ready

The recent growth of the cloud as a platform for enterprise applications means that more organizations are increasingly relying on cloud-based solutions for CRM, HR and other applications. Because Decision Management Systems must integrate with these systems it is becoming increasingly important for products used to build Decision Management Systems to be cloud-ready. This means being able to connect to cloud-based systems to access data and being deployable to the cloud so that decision services can be easily integrated into cloud-based systems.

The cloud also has a lot to offer for the development of Decision Management Systems. Many tasks, such as building predictive analytic models and running simulations or impact analysis, require a great deal of computing power. Being able to push analytic modeling tasks, simulation runs and impact analysis execution onto cloud-based resources means these can be run in background while the user works on something else using their personal computer and can greatly increase the scope of what is possible in these tasks. For products being evaluated for Decision Management System construction, the ability to integrate cloud resources for these high compute power tasks offers great productivity increases.

Heterogeneous Environment

Most organizations of any size have a heterogeneous environment with multiple operating systems, multiple databases, different communication protocols etc. Different channels have different systems, mobile devices, and in-store or kiosk/ATM machinery is unique and organizations often have layers of computing equipment of different ages. No organization ever has a single, coherent architecture across all its systems, at least not for long. Because decision-making components must often support multiple channels and be consistent across multiple systems, products for Decision Management Systems should have multiple deployment options and be easy to deploy and integrate with these different operational environments.

Organizations are often heterogeneous in another way. Some organizations use multiple business rules management systems; many use multiple predictive analytic workbenches as analytic modelers choose their own or use a tool to get access to a specific algorithm. Tools that recognize they must operate in this environment will generally be preferred therefore, especially in the ongoing evolution and management of Decision Management Systems e.g. in analytic model management.

Embeddable Management and Control Components

Decision Management Systems do not stand alone. In particular, the management and control of Decision Management Systems should be easy to integrate into other

management and control interfaces. For instance, it should be easy to integrate analytic model management reporting with more general business performance reporting and business rule management components should be embeddable in other interfaces. A key criterion, then, for products used to build Decision Management Systems should be how easy it is to embed management components into portals and dashboards built using other tools, feed analytic model management data or rule performance data into a regular performance management environment and so on.

Big Data Support

There is tremendous interest in "Big Data" now as the rapid growth of social media, weblog data, sensor data and other less traditional data sources creates new challenges for managing this information. While much of this interest has been around supporting queries and reporting, organizations are beginning to use these new data sources in their Decision Management Systems. Products that can support both traditional and newer Big Data sources therefore offer increased scope for organizations going forward.

Support for Big Data involves being able to bring potentially very large amounts of data stored in NoSQL systems such as Hadoop into analytical modeling as well as into the operational environment. As many of these sources are less structured, it also involves supporting text analytics and operations that use text operators. Flexibility in data definition, so that the variety and velocity of these data sources do not disrupt operations will also make a big difference.

Big Data is often described in terms of an increase in volume, an increase in velocity and an increase in variety: More data, of more types, arriving more quickly. This increase in Big Data volume, variety, and velocity has clear implications for Decision Management Systems. See the section on Big Data for more details.

Decision Monitoring

Most products used for developing systems are unconcerned with the operation of those systems once they are deployed. Products used to develop Decision Management Systems, in contrast, offer much more value if they are able to support the ongoing monitoring and improvement of the decision-making embedded in those systems. Products that provide analysis and other tools that integrate with deployed systems are particularly useful in this regard.

Decision Performance

Measuring overall decision performance by tying decision outcomes and decision-making approaches to business results is an important aspect of Decision Management Systems. In practical terms this means be able to easily log the decisions made, including those made as part of A/B or Champion/Challenger tests, so that they can be integrated with overall business performance data in a reporting environment. Products that allow this kind of recording to be done

automatically or with flags and settings rather than code are preferred as they create a lower maintenance overhead and are more likely to stay up to date as time passes and the decision-making in the system evolves.

Model Performance

Predictive analytic models are generally built at a point in time and so their performance, in terms of how predictive they are, degrades over time. Predictive analytic workbenches that provide automated facilities for monitoring model performance, for identifying models whose performance is degrading, are to be preferred over those that require a development team to hand code this kind of model performance monitoring. In addition, it is often helpful if model performance monitoring tools can support models built in multiple environments, as this is a common situation.

Rule Execution

One of the most important ways in which decisions can be monitored is through logging the rule execution involved in the decision. While this kind of logging can be hand coded into almost any system, a tool that allows this to be turned on, off for different parts of the decision, that handles this automatically as a background task, and that supports it without a significant performance impact is highly desirable. Logs that can be easily stored in database tables and used for reporting and logs that can be easily converted into or viewed in their more verbose format (using actual rule names for instance rather than ids) are also more useful.

Performance and Scalability

As with any technology, performance and scalability should be considered as part of a product selection. Most of the products listed in the appendix are scalable and perform well enough for most if not all scenarios. Organizations with specific and very challenging performance and scalability requirements should be sure to consider these explicitly. For most organizations, it is enough to look for solid scalability and for performance adequate to support real-time decisioning.

Scales Up and Out

In general, it is more important to consider if a tool scales well than to assess its particular performance on a given piece of hardware. If a product scales up and out well then more or more powerful hardware can be bought and used effectively as demands increase. If a product does not scale then, even if its initial performance is superior, an organization runs the risk that future demands cannot be met.

Products that support multi-core processors, in-memory processing, and distributed processing will scale better than those that do not. This is especially important in high compute power functions such as analytic modeling, optimization, simulation, and impact analysis.

Real-Time

There is a general move from batch to real-time decision making in organizations of all sizes and types. Many initial Decision Management Systems, however, are batch oriented or have demands that are not truly real-time with several seconds allowed for responses. Over time, most organizations should expect to see more demand for real-time decision making as well increasing needs to support streaming/event-based systems. Products that have the kind of low-latency, time based capabilities these solutions need and therefore to be preferred over those that do not.

Organizational Scale

Organizations adopting Decision Management Systems generally start with only a single project or two. Over time, they become aware of the ROI of Decision Management Systems and the potential for them to change how their organization, its systems, and business processes operate. At this point, they begin to scale up their plans for Decision Management Systems. Most organizations do not wish to replace the tools with which they are familiar with new tools during this expansion. As a result, products with characteristics that support organizational scale will be usable longer. In particular, products that support industrialized analytics and enterprise rule management will scale to organization-wide use.

Industrialized Analytics

When organizations first adopt predictive analytic models, they generally only build one or two models. These models are often hand crafted by an analytic practitioner and then deployed by hand into an operational environment through batch updates or manual re-coding of the model. As the use of predictive analytics expands, however, hundreds or even thousands of analytic models may be required by the organization. These models must also be monitored and regularly updated if they are to maintain their level of predictability. Given that most organizations cannot simply recruit many more analytic professionals, a more scalable process is required.

An industrialized analytic process emphasizes the use of automation in model construction, both to prepare and analyze data sources and to perform some or all of the modeling itself. It focuses on rapid deployment of models to real-time operational environments and monitors these models automatically to identify when they need to be re-built. Analytic professionals are engaged to handle difficult problems, to check on models that show problems or otherwise to supervise and manage a largely automated production line for analytic models. Supporting this environment requires analytic tools that emphasize scale and automation not just model precision.

Enterprise Rule Management

For decision logic, the problem is slightly different. Reviewing business rules, comparing them to new regulations or policies and making appropriate changes are still manual activities, even when scaling business rules to the whole organization.

The challenges come in being able to find the business rules that matter, ensuring the business rules that should be reused are reused, and in handling governance and security policies. When there are many rules that are owned by different groups and when reuse means that no one organization handles all the business rules in a decision, enterprise-scale management capabilities become essential.

A product that allows federated storage of business rules in multiple repositories, that provides robust integration options with other repositories such as those for services and business processes, and that supports a variety of repository structures will be better able to scale. Similarly support for approval workflows, integrated security and good user management capabilities will be important.

Selecting Vendors

Each Decision Management System requires different subsets of the capabilities described above. The right set of vendors and products is going to vary, depending on the requirements and needs of both the project and the organization as a whole. There are many vendors large and small to choose from, with more being added every day. The products they offer have great breadth and depth of functionality in every area. Every one of the products continues to evolve and grow, adding new functionality and enhancing existing capabilities. Some vendors are merging to create complete product sets or suites under one umbrella while others are collaborating to allow their products to be used together more effectively. PMML already provides some standards support for this collaboration and new standards such as DMN (see Use a standards-based decision modeling technique above) are on the horizon that will extend this.

There are a wide range of vendors available for each of the product categories you need to develop Decision Management Systems. Many organizations will have existing relationships with vendors and will use other software products they provide. Experience with clients shows that familiarity and comfort with a vendor, confidence that you can work well with them, is a strong predictor of success. Some organizations will work with Systems Integrators or other service providers who have strong vendor relationships that will likewise contribute powerfully to a successful project. The “fit” of the vendor(s) you select with your organization is often much more important than the specifics of their functionality.

There is no magic or “best” set of vendors or products. There is a rich set of vendors and products and most, if not all organizations could pick from multiple vendors or vendor combinations and be successful.

Some things to consider:

- ▶ When both decision logic and analytic insight must be combined in a Decision Management System, those Business Rules Management Systems and related products that are “model-aware” and can consume and integrate with

predictive analytic models are more likely to be successful than those that are not.

- ▶ A Predictive Analytic Workbench that supports a range of deployment options for predictive analytic models into production and can monitor and manage these models will generally require less integration work than those that do not.
- ▶ Predictive Analytic Workbenches that support in-database modeling and in-database scoring (directly or through partnerships with others) are increasingly valuable.
- ▶ An optimization environment that supports the generation of business rules (often through integration with data mining capabilities) as well as solving to produce a set of actions will provide more deployment options.
- ▶ Those components that support standard platforms and provide a rich set of APIs and thin client interfaces are generally preferred.
- ▶ Depending on the system involved, a focus on real-time or on batch (or on a mixture of the two) will be essential as will an understanding of the need for support for .Net, Java or legacy platforms.
- ▶ The view taken by the organization of open source products may constrain or focus your selection process.

Next Steps

Armed with the information in this report, consider what will align with your business needs and what standards will work best for you. There are advantages and drawbacks to each, and now is the time to examine the decisions that will be automated and the processes behind them before turning to products.

Once you have narrowed down needs, prepare a short list of vendors. You may want to go with a vendor you already have a relationship with or an entirely new one, as long as the product integrates where it is needed. Review the requirements and conduct full evaluations.

Remember that there are multiple product categories for decision logic management, predictive analytic modeling, optimization, and simulation. Evaluate each based on detailed functionality, including:

- ▶ How complete the platform is
- ▶ How it fits into your existing software ecosystem
- ▶ How open it is, regarding standards

Examine architectural flexibility, its support for big data, decision monitoring capabilities, performance and scalability, and organizational scale. It will be critical to evaluate how business users will engage with the platform and how steep the learning curve is, its impact analysis and impact on application context.

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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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