



Decision Management Systems Platform Technologies Report

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Decision Modeling is one of the five key capabilities needed when building Decision Management Systems. Each can be adopted incrementally, and can scale based on resources and business drivers.

Decision modeling provides a framework for business analysts, business professionals, IT professionals, and analytic teams to specify requirements for technology capabilities, link performance management for results tracking, and orchestrate and coordinate projects as a whole. This makes it easier to focus project teams where they will have the highest impact and to measure results.

Decision modeling with the Decision Modeling and Notation (DMN) standard is a critical piece of Decision Management Systems. Most importantly, decision models are more than just a one-time specification of requirements for Decision Management Systems, however. They are used to frame and manage the whole process.

- ▶ Driving requirements - structuring, and framing business rules and analytic efforts.
- ▶ Defining the decision support / decision automation boundary.
- ▶ Establishing where business rules and analytics have the biggest benefit.
- ▶ Providing traceability from the original business-centric requirements to the detailed technical implementation
- ▶ Updating as business needs change.

To make this work, organizations need to ensure that the decision models built can be integrated with each other into a shared repository and that this is a living repository that everyone can access.

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

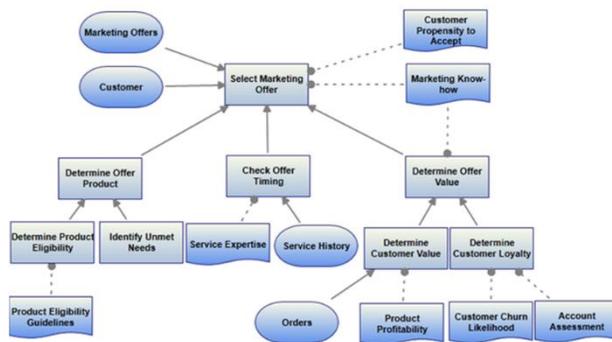
Technical readers are recommended to read the five Key Capabilities documents (*Managing Decision Logic with Business Rules, Embedding Predictive Analytics, Optimizing and Simulating Decisions, Monitoring Decisions and Modeling Decisions*) to better understand the component technologies of Decision Management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

Overview

Decision modeling provides a framework for business analysts, business professionals, IT professionals, and analytic teams to specify requirements for technology capabilities, link performance management for results tracking, and orchestrate and coordinate projects as a whole. This makes it easier to focus project teams where they will have the highest impact and to measure results.

Figure 1. An Example Decision Model



Decision Modeling with the Decision Model and Notation (DMN) standard is a critical piece of Decision Management Systems. It is important to model and manage decisions first before focusing on managing the decision logic, predictive analytics or optimization models that implement those decisions.

A decision model shows how, where, and why to manage and deploy the elements of a Decision Management System while also showing how the decisions fit into the broader enterprise context and performance management systems.

Decision Models are more than just a one-time specification of requirements for Decision Management Systems, however. They can be used to frame and manage the whole process:

- ▶ Build an initial decision model to drive requirements, structuring, and framing business rules and analytic efforts.
- ▶ Use this decision model to decide on the automation boundary - what gets automated, what gets left to people - recognizing that decision modeling is a great way to specify requirements for automation AND to specify how people should make a decision.
- ▶ Use the decision model to understand which parts of the decision might be best automated with business rules, which will benefit from analytics, and where optimization might be useful.
- ▶ Keep the decision model alive to ensure traceability from the original business-centric requirements to the detailed technical implementation
- ▶ Update the decision model as business needs change to support ongoing orchestration of decisioning technology deployments.

To make this work, organizations need to ensure that the decision models built can be integrated with each other into a shared repository and that this is a living repository that everyone can access.

Architecture

The capabilities to support modeling decisions may be delivered as a standalone modeling capability, as a modeling capability integrated with development capabilities such as those for Managing Decision Logic with Business Rules or Embedding Predictive Analytics, or as an integral part of an overall Decision Management Platform. The key capabilities include:

- ▶ The ability to model decision requirements and, potentially, decision logic.
- ▶ The decision models must be put in context and linked to external contexts such as business processes and metrics.
- ▶ It should be possible to assess the impact of changes as they are made or proposed
- ▶ Decision models should be validated and verified and stored in a managed repository.
- ▶ If decision logic has been specified it must be deployable and, if not, then the decision model must be linkable to implemented decision logic.

Decision modeling should be regarded as a critical ongoing component of developing and maintaining Decision Management Systems not simply a requirements approach.

Capabilities

Decision Requirements Management

To effectively automate or improve decision-making, detailed decision requirements must be specified. This involves identifying the data a decision requires, knowledge about how the decision is to be made and related or component decisions. A decision requirements management capability allows these elements to be combined in Decision Requirements Diagrams and associated to form a Decision Requirements Model. The capability should allow multiple diagrams so that multiple perspectives can be seen and the complexity of the model managed. It should be possible to describe each element and provide a rich set of metadata to fully describe it.

Decision Logic Management

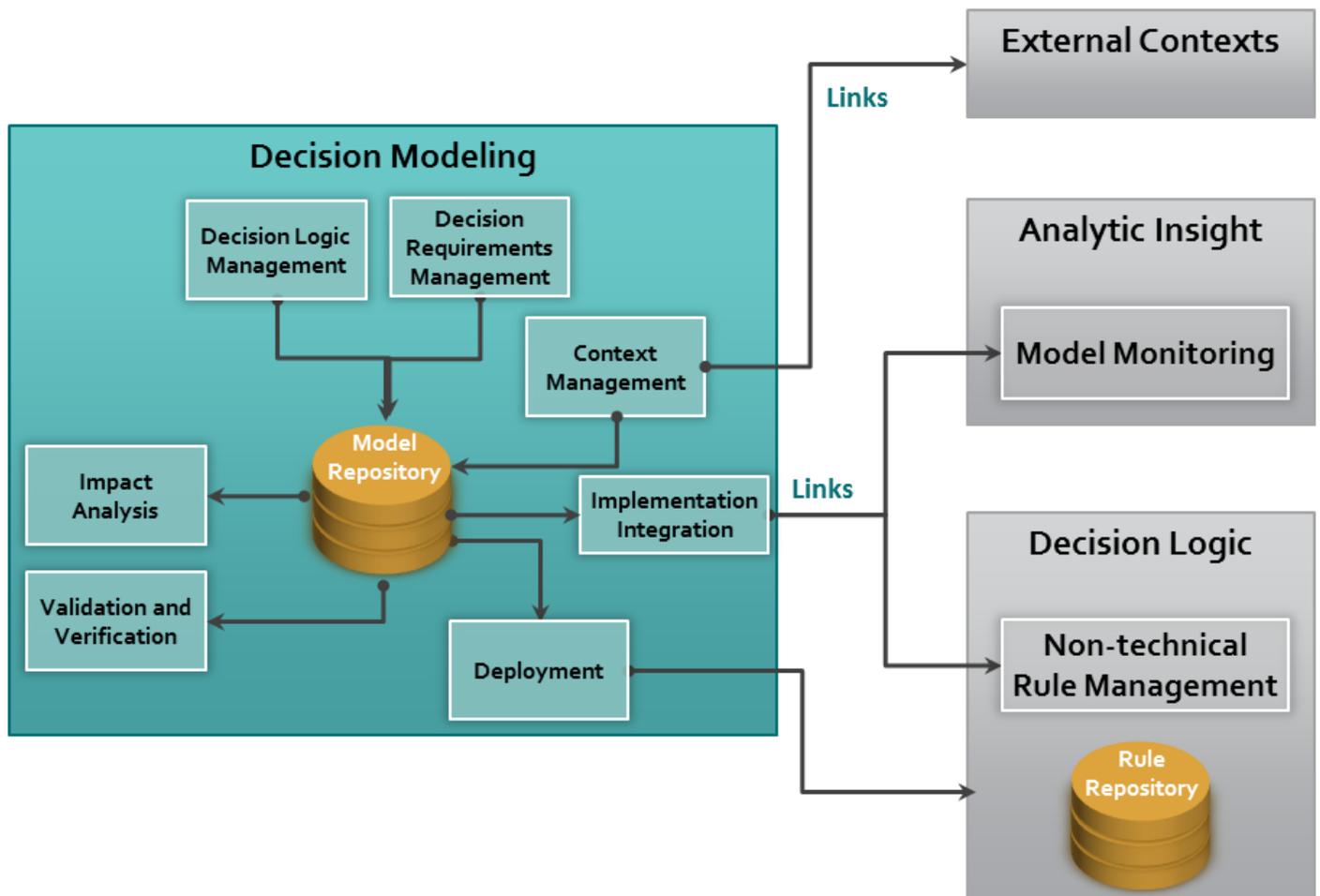
To implement a Decision Requirements Model, the decision logic or business rules behind it must be specified. This can be specified externally to the decision model, see below, or added as an additional layer of detail. If added as a layer of detail, then the Decision Logic-business rules-should be specified in Decision Tables and other logic artifacts for each decision in the requirements model. The requirements model and the logic model should be aligned, ensuring that any requirements modeled are reflected in the logic and vice versa. If decision logic is being managed

in a decision modeling environment, then many of the capabilities normally found in a BRMS must be provided to ensure this logic is written appropriately.

Context Management

Each decision should be put into a business context. Decision models are part of an overall business architecture and need to be linked to other elements of that architecture. This requires support for linking the KPIs and objectives in a business area to the decisions being model so that the business value of decision-making can be assessed. Decision Requirements Models are also linked to business processes through the decisions involved in the model. Any decision can be identified as required by a business process and/or as executed by a task within that process. This clearly identifies the process context for the decisions that are modeled in the

Figure 2. Capabilities for Modeling Decisions



Decision Requirements Model. Organizational impact and other considerations should also be managed.

Impact Analysis

Impact analysis tools allow non-technical users to see the impact of a set of changes on their business outcomes. Business users need to see the impact a change to their decision model will have. The processes and organizations impacted can be found through the context management links while impacts to be model can be traced directly. This need is especially strong when decision logic is being managed as changes to the logic must be assessed before deployment,

Validation and Verification

Decision models should be validated and verified before being stored in a repository. Models should be assessed for completeness and consistency. Preventing logic errors is key, especially if detailed decision logic is being managed.

Repository

Products should offer an enterprise-class repository for storing and managing decision models. This repository may store only decision requirements models and their context or may also store decision logic. It should provide access control and security, audit trails for changes made and versioning at a number of levels. An extensible repository that allows additional information to be added as well as an API for repository access can improve the integration of the product with other enterprise components.

Deployment

If decision logic is managed as part of the decision model, then it must be deployable. This means providing the same kind of capability to generate code or a package of executable rules as described in *Managing Decision Logic with Business Rules*.

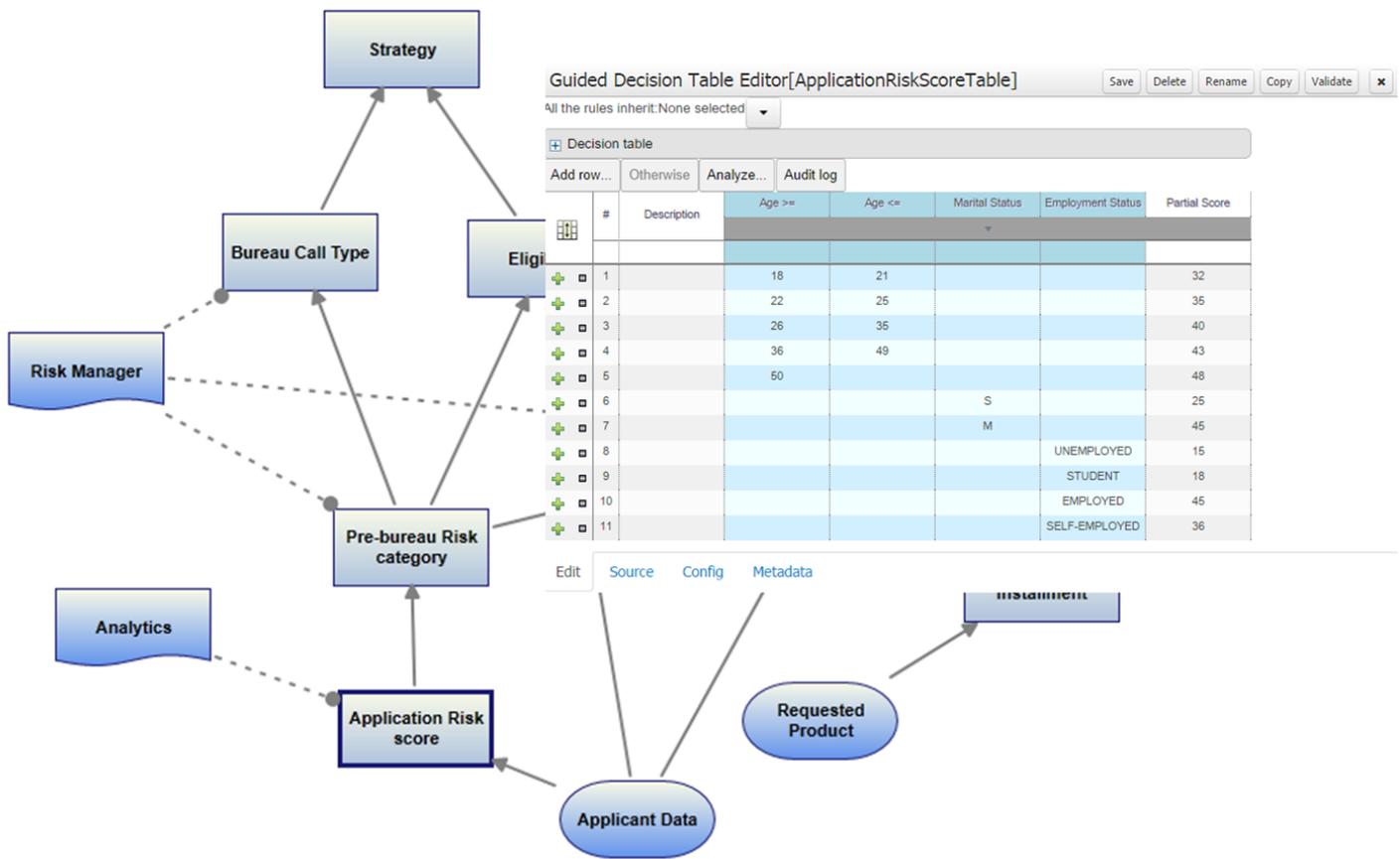
Implementation Integration

An alternative approach exists for implementing a Decision Requirements Model. Instead of specifying the decision logic in the model, the model can be linked to components developed in your implementation environment. For instance, where the decision requirements are best implemented as decision logic or business rules, the model can be linked to Business Rules Management Systems (BRMS). These contain decision logic in well-defined artifacts, not only decision tables but also decision trees and more. The decision logic for a specific decision can be specified in the BRMS and then linked to the model so that a user can easily navigate from one to the other. This allows business users to find the rules they need to manage in their BRMS using the Decision Requirements Model they are already familiar with.

It also allows the implementation team to create other artifacts in the BRMS without exposing them to the business users.

Figure 3 shows an example, linking a decision in a Decision Requirements Model to a decision table implemented in the open source rule engine JBoss Drools.

Figure 3. Decision Requirements Linked to Decision Logic Implementation



Decision Requirements Models can also be linked to the predictive analytic models developed in data mining and other advanced analytic tools. The model shows the information from which the analytic was derived as well as how it is used in decision-making. Linking the Decision Requirements Model directly to the predictive analytic model allows business users to see where analytic models are used and ensures these analytic models are kept in a business context.

For more on develop decision models with Decision Model and Notation (DMN), [download our whitepaper.](#)

Next Steps

There are a variety of product categories and key capabilities to consider when examining Decision Management Systems. Considerations include the completeness of the platform, business user engagement, architectural flexibility, and big data support. Additionally, decision monitoring, performance and scalability, and organizational scale will come into play as these waters are navigated.

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](#)

For more on decision modeling, please also see the author's book [Real-World Decision Modeling with DMN](#), written with Jan Purchase (Meghan Kiffer, 2016).

[Contact Us Today for a Free Consultation](#)

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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Decision Management Solutions specializes in helping organizations build decision-centric, action-oriented systems and processes using decision management, business rules and advanced analytic technologies.

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