Navigating Current and Emerging Decision Modeling Methods and Standards

A Decision Management Whitepaper
Synopsis

Decision modeling is a core aspect of the Decision Management market. The two main standards in the field, Decision Model and Notation (DMN) and The Decision Model (TDM), are related, yet they are sometimes seen as competing. In reality, they are complementary approaches to a similar challenge; both TDM and DMN evolved from a desire to visually represent the relationship of Decision Logic elements for a variety of purposes. This paper will explain where DMN and TDM are the same and where they differ and will also introduce the Business Decision Maturity Model.

Introduction – How did we get here?

The new Decision Model and Notation (DMN) standard owes many of its concepts to experts in the field of Business Rules, Decision Management thought leaders and to The Decision Model (TDM) that came before it. TDM provides guard rails for the more expansive DMN palette by integrating principles and a methodology for how the user should approach decision modeling. TDM in conjunction with a tailored software-suite, such as in Sapiens DECISION, ensures stable and reusable models that follow this methodology. Other vendors and consulting organizations will, over time, introduce their own preferred guard rails for the DMN palette alongside their own methodology and their own tooling. Implementing TDM, Sapiens DECISION has had a six year head start in fine-tuning the combination of features and methods that promote Decision Modeling and especially the more challenging code-generation and model-to-execution deployment. This combination of features and methods that utilizes Sapiens DECISION’s asset management capabilities also elevates the solution further along the Decision Maturity Model scale that is presented in this paper. Sapiens DECISION intends to incorporate DMN’s new and useful features (such as Knowledge Sources) and will soon allow modeling using DMN shapes (notation) for model visual interoperability, and import and export of decision logic for model execution interoperability. This provides the user with the unique and full range of benefits of both visual and execution models and how to manage both as living enterprise assets. It applies to both business governance and technology automation, not just diagrams treated as requirements.
Background - A Brief Overview of Decision Management’s Rise

As automation and agility became increasingly essential, not just to enterprise technology, but to management practices as a whole in the early 2000s, the gap between different automated business system innovations became increasingly obvious. Database modeling adopted the Relational Model as much as 30 years ago, and Business Process Modeling and Notation (BPMN) as a process modeling standard is almost a decade old; however, decision modeling had not evolved, causing enterprises in sectors such as finance and insurance (and others) to conduct Decision Management manually.

Manual Decision Management consists of plain text without a model, open to interpretation with a lack of automation or features necessary for compliance and audit adherence. Similarly, the traditional business rules approach has not evolved to manage the complete and agile business logic lifecycle, from business requirements to code, and especially when subsequent change is needed in the business logic and requirements.

The need for more formal Decision Management and a more evolved business rules approach became clear for a number of reasons. For example, the original mechanisms for defining and automating how business decisions were made does not deliver them in such a way that they could be modeled or developed independent of other dimensions—especially with the acceleration necessary in the modern business world.

Decision Management needed a model that would change the way businesses think about, manage, and leverage the decisions behind systems and processes. Frustration with the lack of such a solution led to the birth of The Decision Model (TDM), which started as a way to visualize and validate the accuracy of decision requirements in model form in Visio or Excel and other software that could produce the TDM look and feel. Then it grew into a full-fledged software solution after Freddie Mac adopted the model in 2009.
Despite the maturation of TDM (based on *The Decision Model: A Business Logic Framework Linking Business and Technology*), the fact still remains—TDM is a proprietary model and consequently cannot be implemented as an open industry standard. In consequence, the OMG agreed that decision modeling needed a standard. Now, in 2016, Decision Model and Notation (DMN) 1.1 is finalized and adoption is beginning.

With DMN rising as the IT community’s standard for business decision modeling, many people are left debating whether the more established TDM or the standard DMN is a better approach. Before the Decision Management landscape becomes too divided, it’s important for the IT community to understand the ability of TDM and DMN to amplify value, bolstering one another with complementary strengths. In fact, they should be recognized as playing clearly different roles.

**Putting the TDM vs. DMN Debate to Rest in Favor of Universal Decision Management**

At first glance it is tempting to conclude that TDM and DMN are competing models that cannot coexist. Nothing could be further from the truth. In reality, the true characteristics of TDM and DMN are too dissimilar to create a fair comparison.

Where TDM is a rigorous model of logic based on 15 essential principles to ensure stable and reusable logic structures with great integrity, DMN provides a more free-form standard with a notation, a meta-model, a set of decision table representations, and an expression language for the purpose of modeling and automating decisions.

Even though DMN and TDM can technically accomplish similar things, the benefits of both in combination are more compelling.

Experienced TDM modelers are encouraged by the fact that a decisioning standard is emerging. Consider the numerous benefits of a Decision Management standard:

- The DMN standard makes the new Decision Management and modeling space more legitimate in the IT community, and strongly solidifies the business-IT partnership in a way not possible before, which ultimately means better software, greater and more interchangeable skillsets, and improved business ROI.
- Standardization provides tangible visibility to a previously untamed and invisible business asset—decision logic.
- With the new standard, any decision expression from no-rigor to extreme rigor is included.
- Standardization ushers in a new era of living decision models as living instruments of change and accelerated change cycles.
- Having a level playing field in Decision Management opens the door to future innovation rather than further development of siloed, proprietary solutions.

When Decision Management professionals have accepted the notion that TDM and DMN aren’t meant to compete, it’s possible to understand the evolving and exciting decision management landscape.
The Decision Maturity Model—Identifying Specific Needs*

Choosing a particular decision model, whether TDM or DMN, is just a small piece of the greater full lifecycle Decision Management puzzle (from modeling to production automation in an unbroken process), which is why the debate between DMN and TDM is misguided at this point. For companies starting to think about Decision Management for the first time (or thinking of making greater use of a Decision Management product), understanding the different levels of the Decision Maturity Model helps identify specific needs as business unit managers and IT teams work together to streamline the Decision Management process for project and enterprise adoption and related innovations coming soon.

**Level 0: Unmanaged**

At this point, the company hasn’t implemented any sort of Decision Management processes. No tool is needed for Level 0, but the risk of loss of business control as well as the risk of business change are high. Coupled with an inability to predict the impact and effort of business changes and high costs for change, Level 0 represents a lack of DM architecture and stewardship that can cause large enterprises to fall far behind competition.

**Level 1: Visible**

Level 1 means an organization has adopted a sketching tool that represents the early days of Decision Management when Visio and Excel were the only means of informal modeling. Level 1 does not provide any way to execute sketches, so the requirements are delivered to IT for coding in the company’s preferred language.

The disconnect between sketching and execution means there is still relatively high risk of loss of business control and business change. However, Level 1 represents an informal DM architecture and, as business analysts lead business decision discovery for local logical development, an ability to manually analyze decisions.

**Level 2: Agile**

In Level 2, decision modeling and execution come together for limited automation. At this point, companies can greatly reduce the risk of loss of business control on an individual project level and automate business change directly from decision models. The business architecture becomes a bit more formal with a project level process and business decision standards on a broad level. Most important is that this is the first level in which decision models become true living assets in that changes are always made to the models and never again directly to automated code.

**Level 3: Aligned**

This is when the enterprise adopts a suite through which it can gain cross-project visibility and any/many-execution ability, meaning any/many target technologies. Level 3 visibility greatly reduces the risk of loss of business control across the entire project spectrum within the organization and enterprises can start predicting the impact of their business changes. This is the first level in which the decision models become truly technology independent – likely to execute even in future technologies with little or no changes to the models themselves.

Improved consistency between business units and increased automation help drive costs per change lower as the business architecture becomes a formal set of business decision standards.

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*Knowledge Partners International created the Decision Maturity Model based on best practices utilized to assess state of adoption at various organizations.*
The volume and complexity of business requirement changes at large enterprises creates a strict need for at least Level 3 on the Decision Maturity Model. However, Small and Medium Businesses (SMBs) have the opportunity to take small steps through the various levels as decision makers create a new culture formed around Decision Management agility. In either case, skipping levels in the Decision Maturity Model can cause culture shock for the workforce, so companies must move iteratively throughout the steps. However, maturity level discrepancies are what often spark debate between DMN and TDM supporters.

Choosing a Decision Management Product for the Right Maturity Level

DMN and TDM aside, there are 12 essential factors to evaluate when choosing a Decision Management tool:

<table>
<thead>
<tr>
<th>Table 1. Evaluation Factors for Decision Management Tools</th>
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<tbody>
<tr>
<td>1. Integration with existing environment and applications</td>
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<td>2. Visualization of logic structures and relationships</td>
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<tr>
<td>3. Ability to define and manage non-executable logic</td>
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<td>4. Methodology for logic definition and propagation</td>
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<td>5. Ability to audit logic sets and identify interdependencies</td>
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<td>6. Integrated and federated business glossary</td>
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<td>7. Lifecycle management of logic, including version control</td>
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<td>8. Ease of maintenance of logic sets and discrete logic updates</td>
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<td>9. Support for test automation and logic evaluation</td>
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<td>10. Execution technology autonomy, scale, and optimization</td>
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<td>11. Standards support</td>
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<td>12. Anticipated Total Cost of Ownership</td>
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The correct blend of strengths and potential weaknesses depends entirely on where a company stands on the Decision Maturity Model and, equally important, where it wants (or needs) to go. At this point, the nuances of DMN and TDM may dictate the tool necessary for specific needs.

-Level 4: Predictive-
Building on the more comprehensive nature of Level 3, Level 4 introduces the ability to predict short-term futures and assess the impact of business changes on these futures. With detailed standards introducing rigorous governance in the business architecture, enterprises can establish firm control of business policies. Most important is the ability to use past decision history to redesign a new future of decision-making.

-Level 5: Autonomic-
This is the ideal state for Decision Management—the ability to optimize business policy to changing conditions in real time against predicted changes in business models and metrics. Level 5 is the introduction of the truly agile enterprise with a business architecture that supports continuous improvement of processes and the full integration of DM in business planning.
There are challenges with the current state of DMN, including the need to evolve the implementation of the execution language FEEL as an industry standard language. For current DMN tools to execute code as necessary in Level 3, Level 4, and Level 5, every tool in an environment would have to support FEEL expressions, and generate executable code from FEEL. Because it’s so early in the DMN 1.1 lifecycle, companies haven’t yet widely committed to the adoption of FEEL, leaving DMN modelers with a need for another way to execute a DMN model in target technologies.

Additionally, current state DMN tools do not have the features that promote it as a first-class modeling platform: strong federated glossary, communities, views, strong built-in governance, versioning, separation of logic from messaging, and the ability to detect logic duplication. In short, powerful asset management.
Where TDM Tools Stand on the DECISION MATURITY MODEL

The level of rigor that TDM entails places clients’ usage of the model at Levels 3-5 (Aligned, Predictive and potentially Autonomic, although in reality, no company has reached Level 5) of overall maturity as defined by the Decision Maturity Model. TDM benefits from the simplicity of its underlying model. Using the guardrails of the model allows TDM tool modelers to rapidly compose each decision with great confidence of outcome.

The range of principles that support TDM gives modelers the ability to build stable, well-formed decision models that likely represent the logic that a business would require. Because the model has been in effect in large organizations since 2009, its consistency, readability and re-usability across an entire enterprise inherently allows TDM tools to reach deeper maturity levels, driven by those large organizations. As importantly, TDM has significantly evolved since its inception with a rich supporting set of capabilities that were driven by the demands of a large base of enterprise adopters. It is clear that many of the innovations demanded of TDM by its pioneering users at inception are now being, or will in time be, incorporated into the pioneer DMN products.

The great value of TDM is the combined guidance and constraints it places on the modeler in the approach to the decision structure. This is its rigor. The degrees of freedom permitted in DMN mean that the modeler has to compose logic from whole cloth, from scratch and without means of detecting errors in individual logic statements and whole models of them. TDM rigor leads the modeler to build, from the outset, well formed, normalized, therefore stable models. This ensures the maximum re-use of the logic structures, and the stability – over time – of the models. In addition, Sapiens DECISION implementing TDM provides powerful asset management features that help manage decision assets across different spans of an organization and features that promote logic reuse, logic integrity and the modeling lifecycle. Moreover, TDM models in Sapiens DECISION are technology agnostic and have been auto-transformed into many run time execution languages of the organization’s choice. The proof is that there are many clients of Sapiens that generate executable code to multiple rules engines as well as to executable Java code.

All of these benefits and values can be accomplished by other tools in time. As best practices are propagated across the industry, different vendors will codify their preferred palette from the superset of options that is DMN and introduce features into their tools that promote certain methodologies. A TDM tool can provide to DMN the rigor of TDM’s proven principles and methodology, to help it reach new levels of maturity for greater adoption throughout the industry.
How TDM and DMN Ultimately Coexist for the Advancement of Decision Management

When Barbara von Halle and Larry Goldberg wrote the book on TDM (published by Taylor & Francis, LLC) back in 2009, they posed a few predictions for the future of Decision Management. One of these predictions was that IT and business professionals who support management and methodologies would soon promote Decision Management and corresponding decision models to prominent management levels for wider adoption across the enterprise. With the standardization of DMN, this prediction is coming to fruition.

There is a great deal more that will have to be added to DMN as it reaches mass adoption as the Decision Management standard. Moving from DMN 1.0 to DMN 1.1 was a huge step as key features such as a concept of Decision Service—the boundary for model deployment—were implemented. In contrast, Sapiens DECISION has been exporting rigorous decision models into Decision Services for multiple execution engines since 2009. However, vendors are dealing with DMN limitations by creating proprietary elements that could potentially fracture the standard if not handled properly.

Sapiens DECISION currently includes features that are on the wish list of DMN 1.1 user groups for future DMN versions (e.g. Collection operators and expressions in decision table cells; message functionality; etc).

TDM and DMN form a healthy partnership where DMN modelers can benefit from the discipline and simplicity of TDM and TDM modelers can benefit from the promise of generality, universality, and interchangeability of the DMN modeling notation.
Specifically, the Sapiens DECISION Suite unifies TDM and DMN by giving users the ability to create models with either DMN or TDM notations, and toggle between each model within the same project. Sapiens DECISION will continue to support DMN and the integration with TDM will give DMN the features it needs as it moves toward greater adoption. The complete Sapiens DECISION Suite—DECISION Manager, DECISION Deployment Adapters, DECISION InfoHub, and DECISION Execution—in tandem with the universality of DMN can give users a living model with comprehensive coverage of the entire Decision Management lifecycle.

The current state of Decision Management (as referenced in the title) is exciting in that it ushers in a new business culture—one that values intellectual thinking and decisioning as a new business and technology set. In years to come, not only will decision models be as ubiquitous as standards based data models, they will also be testimony to the advancement of business decision science and practice—company decision-making will mature into using new methods in a form manageable for study and lessons learned by business people.

If you want to learn more about Decision Management and how the Sapiens DECISION Suite (and the TDM principles that support it) can help you coexist with the emerging DMN standard, contact us now for a Decision Maturity Model consultation.

For more information, please contact us at: info@SapiensDECISION.com