We already have a Business Rules Management System. Why should we consider a Business Decision Management System?

SAPIENS

Partnering for Success

Prologue

To meet the demand of digital transformation, shrinking margins and regulatory pressure …

…large organizations will need to engineer unprecedented change: change to their business models, change to their operational systems, and change to their regulatory practices and technologies. These changes will have to take place while lowering costs and meeting ever more demanding regulation and demands on transparency, accuracy and traceability. We explain in this white paper why legacy business rules engines will not meet this challenge, and why Business Decision Management, a crucial new approach to systems development, is an essential component to success in meeting these challenges.

Sapiens Decision implements Business Decision Management, using true model-based development that reduces the cost of change, increases the quality of business systems, and provides certainty to management of its business systems capabilities.

SAPIENS
Partnering for Success

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1 Introduction

There are currently enormous pressures on financial institutions from three primary drivers:

- Collapsed margins due to continuing and persistent low levels of interest;
- Digital transformation driven by dramatic shifts in business models and the emergence of Fintech as business moves increasingly to on-line, self-service and real-time models;
- Continuous regulatory pressure from the promulgation of new regulations and ever-increasing levels of enforcement

These pressures are forcing change in the business operating model of firms, requiring significant new functionality in existing, and, in many cases, new systems. Firms are pressed not only to improve their ability to change existing systems, and/or evolve new systems, they are forced to do so ever faster, and at ever lower cost to meet the challenges. The harsh fact that many firms face is that the cost to change the business often exceeds the savings effected to the cost of running the business.

A key solution to these challenges lies in the use of Business Decision Management (BDM). This should not be confused with the use of Business Rules technology.

2 The Problems of Use of Business Rules Technology in the Enterprise

Business Rule and Business Process technologies have become ubiquitous in recent years, enabling the rapid development of application systems to meet the demands of building complex, performant systems at scale.

Many large organizations, particularly in highly regulated domains have at least one Business Rule Engine (BRE), or Business Rule Management System (BRMS), and it is also usual to find multiple different Business Process Management Systems (BPMS) in these enterprises.

2.1 BRMS Patterns of Use

The patterns of use of BRMS vary from organization to organization, but it is not unusual to see a specific BRMS acquired to develop a specific application system; over time this has led to enterprises finding themselves with several different vendors of BRMS – and some homegrown rules engines, each with competing methodologies and approaches to business rules.

In some cases, commercial off the shelf (COTS) applications contain their own, internal business rules engines for which business rules must be gathered and maintained. In other organizations, a BRMS is purchased with an eye to enterprise adoption, with the idea of centralizing rule services. Even in these cases it is usual to see projects from different business lines and organizational units use different instances of the same engine, not sharing common business rules, object models, or code. Frequently different projects will use different methodologies and coding approaches while using the same technology.

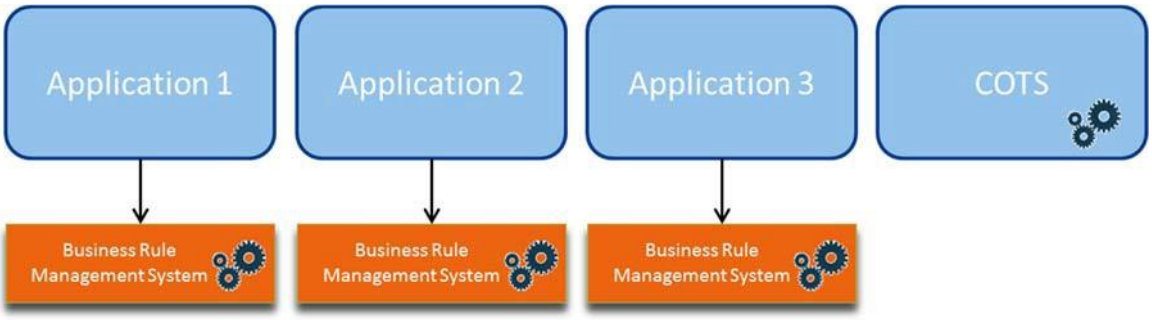

Figure 1: Typical BRMS Implementations in the Enterprise

Only very few enterprises with very mature rules management can overcome the challenges of governance and methodology across organizational boundaries that are implied by such sharing. Managing and governing at the level of business rules is a very challenging and costly undertaking. Consequently, the rules have little or no business value as a strategic lever for management to implement significant change in the organization. Rules are not much more useful than code to read and understand from a maintenance perspective.

2.2 The Opacity of Business Rules in the BRMS

A further challenge in the classic BRMS technology is that it is extremely difficult for the business to understand the logic as expressed in the technology. Typically, the language is highly technical, and is therefore cannot easily be matched to the requirements by the business. The solution is for the project team to "expose" the rules to the business using a custom-built interface for the user (but also proprietary to the BRMS product), allowing the user to review and make targeted changes to the rules. The utility of this approach is specific to limited cases and narrow domains. The simple reality is that BRMS technology is essentially a technology focused tool, with some facility to allow business access to business rules "exposed" by IT to select audiences.

2.3 The Proprietary Nature of the Business Rules Approach

Each BRMS vendor has its own language and its own approach to the form of business rules expression. This means that business rules implemented in one vendor's BRMS must be recoded for entry into another vendor system. The grouping, flow, and the format of the rules differs from one technology to the other, and there is not one representation across BRMS products, so migration from one to another is rarely practical. While some effort has been made in recent years to standardize the form of expression of the business rule, none has been accepted by the industry.

2.4 Managing Business Rules is Very Difficult

For each BRMS system in the market there is a narrow group of experts whose expertise is essential to understand and change the intent and function of the rules contained in these systems.

2.5 Business Rules Require Classic Methods

2.5.1 Business Requirements Documents

Because BRMS is essentially a technology-oriented solution that simplifies the coding process, it still requires classic requirements gathering processes, typically implemented through a Business Requirements Document (BRD). This is essentially a narrative of the requirements expressed in business

terms and is normally a bulky document that must be decomposed into atomic components through some form of System Requirements Document (SRD). All this requires maintaining a matrix to trace the requirements through the technical design to the code that is implemented. In BRMS terms it is seldom that a single rule relates to a single requirement. In fact, the complexity of the rule structures frequently leads to a complex, many-to-many web of relationships between rules and requirements resulting in great, even insurmountable difficulties in maintaining traceability, particularly when changes are implemented. This loss of traceability through change cycles is an endemic problem in the Business Rules approach, with many negative consequences –

- Increased cost of change,
- Inability to document compliance and operational errors,
- Lengthy User Acceptance Testing (UAT) and Rework Cycles

2.5.2 More About UAT

It follows that when classic methods are used, testing against the BRD (or any other form of requirements methods) must be performed after the build, resulting in UAT cycles. In many cases, gaps and conflicts in the rules are only detected during this cycle. When changes need to be made from UAT errors, the cycle of change has to be repeated.

3 The Advent of The Decision Model

The problem with Business Rules is the ***granularity*** with which the logic is managed. Given the number and complexity of business rules it is perhaps impossible to manage rule by rule across the enterprise. It is also not profitable to try to group business rules by subject or type, or any form of categorization, as these soon prove to be artificial, and in due course lead to consecutive attempts at refactoring.

The solution lies in allowing the rules to be organized into a grouping that is natural to the management of the business, and, happily, also conforms to a rigorous structure of logic. Not coincidentally, this allows for the optimum re-use of the logic across the enterprise. Such a structure is called a Business Decision.

The Decision Model (TDM), introduced in 2009, is a broadly accepted, normalized model of logic of a Business Decision that is technology and language-independent and can therefore be used in and with a wide range of technologies.

Each Decision Model represents all the business rules that together lead to a conclusion that the business is interested in managing. It is devoid of any technical artifacts that are not needed for the simple representation of logic, and is consequently independent of any technology, or technology specific representation of the logic.

At the highest level, the decision is represented by a simple graph consisting of only a few different shapes and connectors, which together illustrate the structure of all the logic necessary to reach a conclusion. At the detail level, the graph shapes represent decision tables that are simple for the business to design and build, and for business readers to interpret and understand. The model is subject to 15 principles which enforces the integrity of the model's logic, ensures its business orientation and

ensures that each structure is optimally normalized, supporting reuse and mitigating any duplication or redundancy of logic.

4 The Advent of Business Decision Management

The development of TDM gave rise to a new practice of BDM (Business Decision Management.) BDM is distinct from, but complementary to, the traditional practice of Business Process Management (BPM).

4.1 Challenges in Business Process Management

Business Process Management (BPM) is the approach to optimization and automation of cross-organizational processes. Processes are represented using graphical models, and business people interact with these using a computer interface. In practice, the models fail to accurately represent the logic, a critical component of the processes, because the notation representing those models is unable to model complex business logic.

4.2 BDM as a Solution

The solution lies in BDM – utilizing TDM to provide an accurate and complete model of the underlying logic and the separation of that model from the process model; this allows confusing and incomplete logic representations to be removed from process models. Now, a specialized Decision Task in the process diagram indicates where an invocation of logic is necessary. The logic is represented in an independent, but related Decision Model based upon TDM. The process model becomes simpler, easier to manage and deploy and maintain.

5 Why Sapiens Decision

Sapiens Decision was the first tool to support BDM and remains the market leading and most advanced Decision Management tool today. Using the rigorous model of logic, TDM, in a “design thinking” approach, Sapiens Decision provides the means for the business – not technology – to design, test and deploy decision logic on an enterprise scale.

This enables firms to:

Think about the solution: Sapiens Decision solutions are designed graphically by business users, maintaining traceability of the models to the knowledge sources – regulations, policies, operational requirements;

Test the solution: As models are created, they are validated for logical integrity, and then tested using data that is either automatically generated by the tool, or taken from the firm’s own data sources, to determine whether the logic does what the author intended;

Deploy the solution: Sapiens Decision enables the modeler to deploy the tested solution, as approved through the configurable governance process, into the production environment, all the while automatically maintaining traceability to the models, and to the knowledge sources connected to those models.

5.1 Time to Market

Because the "Think, Test, Deploy" approach removes significant analysis and rework from the development cycle, projects using Sapiens Decision are shorter, bringing the solution to market in shorter time, at significantly lower costs. Decision management-based projects lend themselves to agile style programs due to their ability to deliver complete, tested and executable code into continuous integration environments directly from business analysis teams.

5.2 Productivity Improvement

A key component of value of TDM is the productivity which it fosters in discovering and authoring of business logic and/or in building the decision logic mined from code. Sapiens Decision significantly improves this capability and has been shown to be able to handle very large collections of business logic. The performance, measured by a Sapiens Decision client, of TDM and Sapiens Decision within a year of implementation is illustrated in Figure 2. In addition to this level of productivity improvement, Sapiens Decision users are routinely able to implement even large-scale change requests into production within the same day as requested.

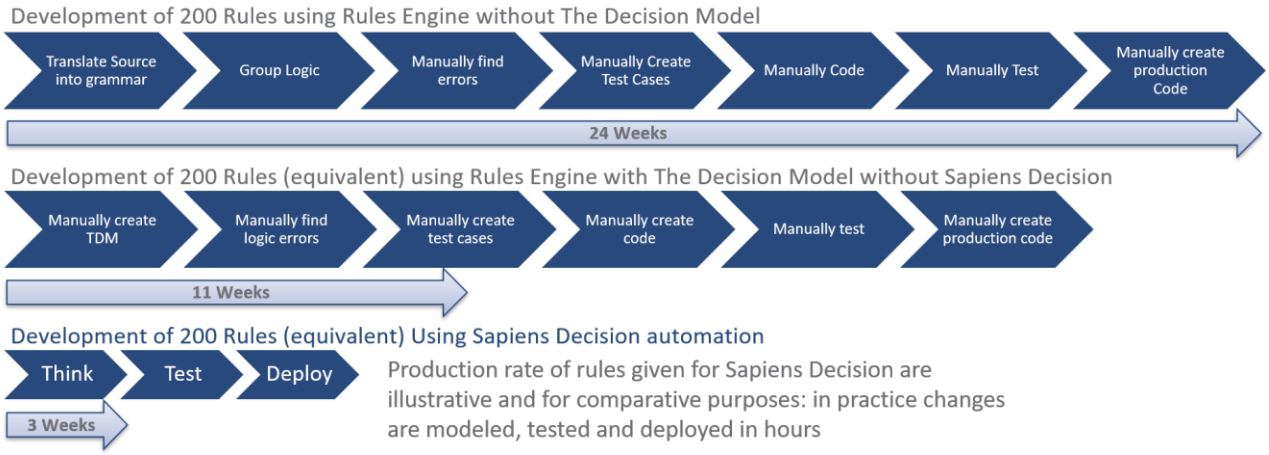

Figure 2: Illustrative Productivity Achieved with Sapiens Decision

5.3 Qualitative Improvement

Organizations implementing Sapiens Decision report significant qualitative advantages over previous methods, such as those provided by conventional BRMS tools. These improvements are dealt with in detail in the following section.

6 Why Can't BRMS Tools Manage Decisions?

All this begs the question: if we simply group the rules in a BRMS engine into decisions, can we not use our existing BRMS to manage decisions? The answer is an emphatic no, for several reasons.

6.1 Unique Capabilities Compared to Conventional BRMS Tools (particularly those that have now added additional DM capability on top of their legacy tools)

Organizations implementing Sapiens Decision report significant advantages over previous capabilities methods, such as those provided by *conventional* BRMS tools. These improvements derive from the many unique capabilities in Sapiens Decision, of which the following are examples:

- Enterprise level governance enforced over the *requirements, authoring, testing and deployment* of the logic assets *(in most technical tools, governance is over the technical artifacts, not the business artifacts)*, ensuring corporate wide standards across all logic assets;
- Business friendly glossary ensures that *all logic is written in simple, business friendly terms eliminating the complex expressions and naming conventions that make typical business rules so difficult to understand and relate to business use cases*, leading to confusion and misunderstanding;
- Community federation of the repository of logic, allowing *complex business environments to be represented*, so that the business may rapidly and economically describe the logic at any level of customization in the context of the business;
- Decision Views, a *unique method to represent and manage subtle and specific differences in logic* between clients, regions, markets, channels and other complex variations and differentiations, while eliminating duplication of logic and maintaining reusability, traceability, manageability and testability of the logic
- *Graphical and instant traceability from the code, through the models to the source of the logic is a unique capability of Sapiens Decision*; this ensures the single source of truth of that logic for auditability and compliance at a level not possible in any other tool;
- Ability to display executed results from the code in the modeling environment, allowing anomalous results to be displayed in their business context. *This feature is a unique capability of Sapiens Decision because all logic is modeled at the business and not the technical level*. One client reports reducing the time to trace and fix anomalies was reduced to hours using Sapiens Decision compared to weeks in their legacy systems.

6.2 BRMS Tools are Technology Tools

The impact of the technology orientation of BRMS tools is evidenced in several areas:

- Improved execution performance: the structure of TDM enables Sapiens Decision to transform the models into code that is extremely efficient and performant. Experience has shown that Decision generated, compiled Java significantly outperforms manually coded business rules executing the same logic.
- BRMS tools do not have business language glossaries that enable the business to construct logic in an easily understood form. The object and data models used by BRMS technologies refer to complex data structures, and not to business-friendly names and concepts.
- While many BRMS tools can use Decision table formats for their rules, these formats do not support the principles of TDM, nor any other guidelines that enable the business to make certain that they achieve rigorous and normalized models and ensure reusability and logical integrity of the models.

- While many of the BRMS tools have workflow and governance, that governance typically does not extend to the business artifacts and business activities of the modeling process. This means that the traceability of the logic to the knowledge sources is not managed and will therefore lack integrity and auditability.

6.3 BRMS Tools lack a Business Model of Logic; they cannot create a Business Design (Also – the advantage of TDM with DMN notation against plain vanilla DMN notation)

TDM allows business designers to model "top down" – to frame a business Decision that is responsive to a business need and design the logic to support such a Decision. BRMS tools, because they define logic a rule at a time, do not support such a concept; more importantly they do not have a defined model of business logic that provides the building blocks of the logic solution to build the top down model.

Decision Modeling & Notation (the Object Management Group specification and standard for decision modeling notation and metamodel) is a well-defined industry standard, to which Sapiens Decision NexGen is highly compliant. However, DMN does not define a model of logic, merely a standard of notation, metamodel, and requirement that the logic be unary. This is of value but fails to provide a model of logic that ensures consistency, normalization, maximum re-use, and a standard that enables business people to provide consistent accurate and predictable models. TDM and its top down methodology ensures that the model will have logical integrity, and perhaps even more importantly, ensures that each component of the model will be expressed in the simplest possible way ("normalization"), ensuring the most stable, and most reusable logic structures possible.

6.4 BRMS Tools are Unable to Test the Business Design

BRMS tools can, and do, provide testing capabilities of the coded and compiled business rules. However, this is a technical implementation that requires technical skills. Business folk are unable to do design thinking, and then test the resulting design. The design thinking in Sapiens Decision begins with the methodology of TDM, following the TDM cycles of iteration between the business design, followed by the coding design, and finally automated coding, to achieve a testable unit.

In Sapiens Decision, the business user can design the model, while the tool both guides the user, and applies the necessary validations to ensure that the model complies with the TDM principles. Then the business user may construct test cases, or import test cases, or have the tool generate appropriate test cases. The tool is then able to convert the models into code, compile the code, and execute the test cases, delivering the results immediately to the business user. The results may be viewed in tabular form, or in graphical depiction within the model. All of this occurs within the modeling environment without intervention of technical resources, and before any code is deployed into execution environments.

The reality is that structuring business logic into decisions in Sapiens Decision produces highly performant code. In practice, Sapiens Decision clients have been delighted by the performance of native Sapiens Decision Java components, or by the performance of Decision Execution (DE) server.

7 Conclusion

Many of the world's largest financial institutions have already proven the effectiveness and impact of Sapiens Decision.

Whether driven by:

- Digital transformation leading to changes in business models,
- Pressure on margins and the need to drive costs out of operations, or
- The intense pressure of regulatory change,

there has never been as great a need for change in enterprise IT systems.

Central to that change is the business logic that underlies firms' major operational systems.

The Sapiens Decision platform, and Business Decision Management are key to implementing change at dramatically lower costs and faster cycles; this will be a determinant in firms' future prosperity, and perhaps their survival in this unforgiving yet exciting time.

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