Research

Competitive Review of Operational Decision Management

A high-level review of ODM offerings from FICO, IBM, JBOSS and Oracle

Author: Steve Craggs

1.00

October 2012

Table of Contents

Disclaimer

Whilst reasonable care and skill has been taken by Lustratus Research Limited (the company) in the preparation of this report no liability is accepted by the company (except in the case of death or personal injury caused by the company's negligence) by reason of any representation or any implied warranty condition or other term or any statutory or common law duty or otherwise howsoever arising for any direct or indirect general special or consequential damages or loss costs expenses or other claims (whether caused by the negligence of the company or otherwise) which come out of the provision of this report or its use.

All trademarks are acknowledged as the property of their respective owners.

Executive Summary

Lustratus has written in detail about Operational Decision Management (ODM) in the past, and this report is not intended to replay the ODM story in general. The purpose of this report is to take a new look at some of the leading ODM offerings in the marketplace. This review looks at ODM approaches and solutions from four quite different vendors – FICO, IBM, JBoss and Oracle. But as a reminder, in simple terms ODM is about using business rules and events technologies to deliver a formalized approach to implementing operational decision-making, such that decisions can be directly updated and managed by business users within a clear business context. It is by empowering business users in this way that companies can generate the agility, innovation and service quality required to compete in today's cut-throat markets.

Each of the vendors covered in this review has approached the problem from a different perspective. FICO has a history of handling highly formalized and often complex business rules, stemming from its initial involvement with the FICO credit-rating scorecard. IBM has continued to expand its SOA infrastructure to encompass ODM needs, bringing in its extensive array of analytics tools along the way. JBoss has delivered a productization of an open source business rules project, designed as part of the JBoss middleware stack, and Oracle sees ODM as part of its Fusion Middleware stack as well as a useful tool for driving value from its commercial application portfolio.

This report looks at the ODM offerings from each vendor, and then contrasts them against each other based on a set of user drivers; time to value, TCO efficiency, risk mitigation and overall value potential. The table below provides a high level summary of the comparative strengths of each solution across the user drivers identified above.

	Time to value	TCO efficiency	Risk mitigation	Value potential
FICO	■■■■■■■■□□	■■■■■■■■□□	■■■■■■■■□□	■■■■■■■□□□
IBM	■■■■■■■■■□	■■■■■■■■■□	■■■■■■■■□□	■■■■■■■■■□
JBoss	■■■■■■■□□□	■■■■■■□□□□	■■■■■□□□□□	■■■■■■□□□□
Oracle	■■■■■■■□□□	■■■■■■■□□□	■■■■■■■□□□	■■■■■■■□□□

Figure 1: Competitive summary of ODM solutions from FICO, IBM, JBoss and Oracle

However, over the whole report one factor stands out. While there are differences between each offering, and these differences may be very influential for individual companies in their own purchasing decisions, it appears that IBM has broken away from the pack with its delivery of a highly supportive and non-technical Web 2.0-style environment for business users to create, change and review decisions. The collaborative nature of this support together with its similarity to common user experiences like Facebook and Google results in delivering real empowerment to business users, enabling them to respond and innovate efficiently, productively and without fear. In Lustratus's opinion, until other vendors catch up this gives IBM a clear lead.

Introduction

This paper takes a high-level look at four of the leading vendors of ODM solutions; FICO, IBM, JBOSS and Oracle. The methodology for this review follows the same approach as used in all reviews in the popular Lustratus competitive reviews series, providing a factual summary of each vendor's offerings against a common frame of reference and then reviewing each offering against a backdrop of buyers' wants and needs.

What is Operational Decision Management?

In essence, Operational Decision Management (ODM) is all about providing the ability to formalize and automate business decisions in the operational IT environment, ensuring greater repeatability, accuracy and speed with corresponding improvements in business outcomes. ODM solutions should provide the ability for business rules and events to be authored and maintained by business domain experts rather than technically-skilled personnel. These govern the behaviour of the IT systems by controlling decisions based on individual business transaction criteria combined with enterprise-wide visibility and awareness of business activity in both historic and point-in-time dimensions. By placing control of these rules and events in the hands of business users, ODM delivers business agility and visibility as well as better decisions and outcomes.

Rules vs Events

As stated, ODM is all about business rules and events. However, the fact is that many companies start off with business rules projects before starting to expand into the use of business events.

The reason is that business rules are quite 'procedural'; the business transaction proceeds until it comes to a decision point, then executes the rule to make the decision before progressing to the next step in the transaction. This concept is relatively straightforward, since the decision is seen as just another step in the procedure. However, events processing brings another dimension to business decisions. For example, a combination of activities across the business at a particular point in time might trigger the execution of a business rule. In this situation, the rule is not being driven as part of a specific transaction, but rather is being triggered asynchronously by the occurrence of a series of events. This type of asynchronous processing is a much more difficult concept to grasp; it brings a whole range of new possibilities in effective decision management, but many do not currently have the skills to take advantage of this technique. As a result, it is likely that most ODM projects today will be heavily geared towards business rules, with business events used sparingly.

Why ODM now?

The analysis of vendor offerings that follows must be set against the current market wants and needs in order to offer the most insight. Looking at market conditions at the moment, it is clear that many companies are still finding business challenging; there are worldwide pressures on levels of spending, and investment is hard to come by. From an external perspective, there is also considerable pressure on operational compliance due to extensive regulatory changes coupled with increased levels of inspection. The result is that companies are very focused on gaining new customers, serving existing customers with maximum efficiency and effectiveness and doing so while clearly and demonstrably adhering to industry regulations and individual country legislation.

Some of the drivers to achieve these goals can benefit substantially from an ODM solution that makes operational decision-making repeatable, predictable, fast and transparent:

- **Improve operational efficiency and effectiveness**. Automate decision-making to deliver faster, more accurate decisions while reducing costs.
- **Deliver an enhanced customer experience.** Rapid, accurate and repeatable decisions promote customer confidence and speed customer service, leading to better prospecting, improved competitiveness and shorter sales cycles.

- **Increase business agility**. Enable the business community to change operational decision-making quickly in response to market changes and opportunities.
- **Deliver better business insight.** Provide business-context visibility of decision-making policies and procedures as implemented in the operational systems, to enable continual improvement and compliance validation

What makes ODM particularly attractive is that it can be very targeted in its application, reducing the overall investment required to deliver benefits, shortening payback times and mitigating risk. Instead of having to understand the whole of a particular process or operation, ODM can focus on the key decisions affecting operational performance, delivering value quickly for relatively minimal investment. In the current economic climate, this is a powerful factor to take into account.

Assessment approach

This assessment follows the standard Lustratus approach for competitive evaluations. The first task is to provide a factual summary of what each competitive solution offers. Once this is done, it then becomes possible to contrast the different solutions on a level playing field, having 'normalized' the capabilities and characteristics of each offering.

In order to achieve the first step, a frame of reference is required within which the offerings can be described. Lustratus takes the view that this should not just be a functional checklist; it is also important to consider what characteristics the offering has, such as its reliability and ease-of-use, and what additional measures the vendor has taken to broaden the solution or add more value. The frame of reference for the comparative assessment that forms the second part of the review is dictated by the set of generic buyer wants and needs such as time-to-value.

ODM offerings – frame of reference

The elements of the frame of reference will form a backdrop to describing what each vendor offering does in comparison to each other. There are three key areas to be considered:

- **Functionality**: What ODM functionality does the vendor offer?
- **Characteristics**: What characteristics are delivered as part of this functionality?
- **Solution extensions**: What has the vendor put in place to fill out the offerings into broader solutions?

A summary of the key categories in each area is included below. Each area will then receive a little more explanation.

Functionality	Characteristics	Solution Extensions
• Rules development • Events specification • Collaborative design • Save/Browse/Load of decision components • Test and simulation • Deployment • Integration with other components • Operational monitoring and feedback	• Usability • Range of supported inputs • Time-to-value • Import / export • Samples • Scalability • Performance • Security • Versioning • Dynamic deployments • Governance	• Business Analytics • BPM support • Ruleset templates • Professional services • Partner ecosystem • Collaboration community

Figure 2:- Reference framework for outlining vendor ODM offerings

Functionality

The fundamental components of ODM are the business rules that describe the decision-making process for particular business scenarios, such as calculating the loan interest rate to be offered to a client. Business events add the ability to trigger particular rules and other activities based on pre-set patterns of operational activities,

such as a sudden surge in orders for a particular product line across a range of stores. It therefore follows that all ODM offerings must provide a way to develop these rule and event specifications. However there is a key aspect of ODM that must be taken into account when considering development and maintenance; much of the value of ODM comes from putting the ability to author and edit these specifications in the hands of the business community. This is where the agility and visibility comes from. The rules and events need to make sense in a business context, and then business users need to be able to change them to respond to new market developments as quickly and easily as possible.

Therefore there is considerable focus for ODM tools on how well they cope with this need to offer a non-technical interface to rules and events development. But the task is made harder by the fact that as part of deploying these rules and events, a more technical level of development will need to be done. Therefore it is up to the vendor to ensure that the needs of both the non-technical business community and IT are addressed effectively.

Collaboration is an area that is gaining increasing attention. Business rules and events are a distillation of knowledge about business operations and how decisions should be made, and as such they potentially embody the skills and experience of a number of different individual domain experts. By enabling these experts to collaborate in the development phase, a company can ensure the best possible results. There have been many improvements in collaborative techniques over the last few years, encompassing tools such as wikis, chat-based event streams and document tagging. How each vendor addresses this need will be an interesting comparative point.

Following the successful creation of these rules that form the building blocks of each decision, together with any events also being used, these 'artefacts' need to be saved and made available to others for browsing and reuse. At this stage, they will also need to be tested, either against manufactured data and/or historic snapshots of operational data. Once this has been carried out, the rules and events need to be deployed for general usage. This brings up another potential area of differentiation – the ability to hook the rules and events into other components. For example, Business Process Management (BPM) provides the ability to formally define the flow of an entire business process and then execute based on that flow. This flow will probably contain multiple decision points where the subsequent flow will change depending on the decisions made. This is an ideal entry point for ODM to provide the decision-making logic to work within the BPM flow, but this of course requires some sort of integration between the ODM offering and the BPM one. Another important integration area is with applications; in order to influence application behaviour to control the decisions made, it will be necessary to hook the ODM tool into the target applications, whether they be home-grown ones or commercial packages.

Once the rules and events are deployed, a key element of being able to continually improve decision accuracy and effectiveness is the ability to monitor decisions and track the results they deliver. Each offering is likely to have some sort of support for feeding back this type of information; whether in the form of reports, executive dashboards or detailed online monitoring, and this will be another important assessment factor.

Characteristics

Having looked at basic ODM solution functionality, the second area covers the characteristics of the ODM offerings. A critical one has already been touched upon – the usability of the rules and events development task. The importance of usability for ODM tools stems from the need to present the functionality to non-technical business users as well as technical IT staff. How this is handled in the different offerings is likely to be a key area of differentiation. However this is not the only aspect of usability that is important; users will need to be able to browse collections of rules and events to reuse existing ones, and will also want to be able to test and simulate potential changes easily and within a business context.

Another key characteristic that will heavily influence the accuracy and effectiveness of ODM-controlled decisions is the ability to handle a wide range of inputs to the decision-making process. Decision quality is almost always governed by the amount and accuracy of available data, and the ability to bring in multiple different sources of

information will therefore improve decision outcomes. While business rules will probably be focused primarily on contextual information geared to the transaction being executed, business events may take a much wider view of operational status, analysing and correlating information from many other systems.

The time-to-value characteristic is obviously closely linked to usability, but there are other aspects that should be considered when reviewing ODM solutions. For example, sample rulesets based either on industry-specific or cross-industry 'generic' decisions can really speed up development, while import/export facilities may also help in the sharing of rules and events content with other environments.

Once in production, the scalability, performance and security characteristics will come to the fore. These rules and events will be controlling operational decision-making, potentially affecting every aspect of business performance, and therefore it will be essential to ensure that introducing these automatic rules does not jeopardize system responsiveness or inhibit volume and growth. Also, the critical nature of decision-making makes security imperative.

Other characteristics that will be relevant refer to the overall manageability of the ODM implementation. This covers aspects such as versioning, allowing rulesets and associated events to be modified and developed with the requisite level of control, dynamic deployment to put new changes into production as needed and governance capabilities to ensure proper approval cycles for changes and the appropriate measurement and reporting facilities on ODM performance.

Solution extensions

As is often the case with software-based solutions, vendor offerings are likely to differ in the area of overall solution extensibility and breadth beyond the basic software products. An important example for ODM is the ability to deploy business analytics as part of the decision-making process. As has already been discussed, decisions will be improved by enabling the process to bring in information from multiple different parts of overall operations, but these gains can be enhanced further by offering analytical capabilities to make sense of all the available information. While business events processing already offers the ability to analyse and correlate situations across a range of incidents, Complex Event Processing (CEP) technology can ratchet this up to another level, providing the ability to process much higher volumes of data and perform more complex filtering and matching. Continuous information streams pouring in from RFID sensors is just one example where CEP technology will be a vital add-on to standard business event processing. But it is important to note that while standalone CEP tools provide the mechanics for handling demanding situations in terms of information gathering and correlation, the business events layer is still required to put all this information into the proper business context.

Business Process Management (BPM) integration is another relevant extension area for ODM. While ODM can be deployed standalone, it has a natural affinity to BPM since BPM process flows frequently have decision points along the way where the subsequent flow will depend on specific business rules and events. Therefore another possible area of differentiation across vendors is how well their ODM offering integrates with BPM.

It may also the case that there will be some industry or cross-industry use cases where the decision-making is relatively well understood at a generic level. Some vendors may provide templates of event and rule definitions for specific industry needs, such as provisioning in the telecommunications industry for instance. These templates would then need to be customized by companies for their own usage, but provision of these templates would significantly speed up value delivery. In order to facilitate this further, some vendors may offer support for industry-based user communities where domain experts can collaborate on the development of these templates.

Another aspect of a broader ODM solution approach that could speed up delivery and make it more effective is the provision of professional services resources that can bring the benefit of past experience with ODM deployments, combined with a partner network that can augment the vendor-provided resources by providing local support and specialized industry expertise.

Taking a look at the ODM offerings

This report looks at ODM offerings from four vendors; FICO, IBM, JBoss and Oracle. Each offering can now be summarized against the frame-of-reference detailed in the previous section. The intention is to pull out salient points rather than to provide an exhaustive, in-depth analysis of each solution. It is expected that prospective users will carry out their own due diligence analysis of the details as part of the RFP process.

FICO

FICO was founded in 1956 as Fair Isaac Corporation, an analytics company specializing in such mathematical algorithms as Credit Scoring. FICO Score has become one of the most common credit rating services in the US. From this grounding in algorithmic-based analytics, FICO branched out into more general business rules functionality with FICO Blaze Advisor.

However, FICO has never lost its roots, and it offers a selection of decisions-based tools for specific industry needs. These tools leverage FICO's predictive analytics expertise to offer specialist solutions for areas such as debt management, credit approval, claims handling and CRM. Each selected area has been chosen based on its suitability to a mathematical, predictive analytics model for making decisions, with Blaze Advisor being used internally as required to implement these decision algorithms.

Functionality

FICO Blaze Advisor Enterprise Edition is the prime product of concern in this review, being the general purpose FICO business rules management system (BRMS). The main tools for authoring, modifying, testing, simulating and deploying FICO decisions are the Blaze Advisor Builder IDE, an Eclipse-based development tool, and the FICO Rule Maintenance Applications (RMAs) which are browser-based authoring tools customized for particular business user needs.

The general procedure for developing decisions and their associated rules and rulesets starts with a graphical model of the decision flow. Each step in the flow can now be turned into Blaze Advisor rules, initially created with the IDE. The RMAs are for later modifications and updates by business users, but the initial step is to use the more developer-oriented IDE. Rules are then gathered into rulesets that apply to the particular decision. The IDE can also be used to tailor particular 'business user' views that are exposed through browser-based RMAs.

Rules can be specified in a number of different ways; freeform using FICO's Structured Rule Language (SRL), through point and click style templates / formula builders or in various rule metaphors such as decision tables, decision trees and scorecards. FICO's SRL is an English-like language, but there is a clear trade-off – it offers considerable power in its functionality, but it does require a certain degree of precision in its usage. FICO has given special attention to large, complex rulesets; for instance, its Decision Graph facility can handle decision trees with thousands of nodes. In terms of integrating with other environments and data sources, Blaze Advisor can link with XML, Java and .NET/COM objects as well as a range of databases.

FICO rules / rulesets are stored in a common repository, enabling at least a basic level of collaboration between rule developers. The IDE or RMAs can be used to pull rules out of the repository and modify them, storing them back under version control. These changed rules can then be deployed dynamically. FICO offers rule validation against supplied test data, and also rule simulation based on historic data to evaluate the impact of any proposed changes. In addition, there is a visual comparison editor that illustrates the differences between different versions of decision tables or trees during the development process. Once created, the rules are deployed for use under either a Java or .NET runtime environment. Rules can be invoked through the native FICO Blaze Advisor API or as web services. However, the Blaze Advisor run-time component does not provide full application server facilities but instead runs in a JVM or .NET environment supported by an underlying application server environment. Blaze Advisor rules can also be exported in the form of COBOL copybooks for

use in legacy COBOL applications. In all cases, the same Blaze Advisor ruleset can be deployed in any supported operating environment without any changes required to the underlying rules.

At execution time, Blaze Advisor supports two different models of execution. The first is the standard procedural model where individual rules making up the various decision steps are executed in a specified sequence based on the design specifications, but the second makes use of FICO's RETE-based inference engine to offer optimized execution of complex rules. In terms of monitoring and auditing services, FICO provides a basic level of support, offering the ability for monitoring classes to be created that can capture data at various different levels of granularity including server, service, session and execution. Developers can also use the native Blaze Advisor API to specify specific user-defined event points that can be monitored.

Characteristics

FICO Blaze Advisor offers a number of specific usability features. Perhaps the strongest is the Rule Maintenance Applications (RMAs). These browser-based, customized templates are created by the developers using the Eclipse-based IDE, enabling business users to be presented with exactly enough information to maintain and modify rules as required. In addition, there is an Excel plug-in which introduces a Blaze Decision Table tab to Excel, enabling business users to change decision tables from the familiar Excel tool. Apart from these measures oriented around business user usage, the graphical decision flow development tools can also improve usability, particularly where the rulesets are large and complex. However the reliance on the Structured Rule Language (SRL) for text-based rules specifications provides a definite learning curve.

FICO offers a number of preconfigured rules-based applications that do speed time to value, covering areas like fraud detection, payments processing optimization and debt management. Many of these value-add options are geared to the banking industry, which is not surprising since this is by far the biggest market for FICO, but there are also packaged solutions for insurance and healthcare claims handling as well as various salesforce automation and CRM needs. However Blaze Advisor does not provide any import/export capabilities to allow rules to be shared with third party tools.

Scalability and performance is strong in terms of decision processing, but less so in overall terms. FICO has a lot of experience with mathematically heavy decision-making algorithms involving large numbers of variables, stemming from its long-term involvement in the area of banking and credit rating, and it has built on this with the acquisition of expert skills around RETE-based inference engines to produce powerful and optimized decision-making execution. Huge decision trees with thousands of nodes can be developed with the help of the Decision Graph functionality, for instance, and then the inference engine can ensure optimal execution. But in end-to-end terms, FICO relies on the performance and scalability characteristics of the underlying execution platform such as a J2EE application server. So for example, provisioning, security and high availability needs are assumed to be handled at this lower level, although Blaze Advisor does manage development access and locking to preserve rule integrity when being updated from multiple locations.

Blaze Advisor rules and rulesets are stored in a common repository with full versioning and audit support. Changes are tracked, past versions can be inspected and compared to current versions, rule authors are identified for each change and versions can be rolled back if required.

Solution Extensions

Predictive analytics is one of the core areas of FICO expertise. FICO has combined this with an extensive familiarity with banking needs to produce a number of specific solution extensions that bring a rules-based foundation to a number of different applications in either in-house or Software-as-a-Service forms. It offers solutions for areas such as CRM, marketing, claims handling, debt management, fraud management and credit risk management, backed by FICO Global Consulting's domain knowledge.

However, interestingly FICO has not made any attempt to supply the other part of the business process equation – a business process management (BPM) component. Instead, it has decided to work with third party

BPM providers to position Blaze Advisor as their BRMS solution of choice. Current relationships exist with Software AG / webMethods and Oracle for example.

The table below summarizes the salient points regarding FICO's ODM support:

ODM from FICO

Functionality	Characteristics	Solution extensions
• Eclipse-based development IDE	• Rule Maintenance Applications (RMAs) offer customized, browser-based authoring interfaces for business users	• No BPM support - relies on third party relationships such as with Software AG and Oracle
• Customized, browser-based templates for business user access and maintenance	• Excel plug-in for manipulating decision tables	• No CEP support, although user can define event points manually
• Proprietary Structured Rule Language (SRL) for rule definition	• User-specified event handling support	• Range of preconfigured applications for specific use-cases such as fraud detection, debt management, CRM and payments handling optimoization
• Grpahical support for decision trees, tables, and scorecards	• Highly optimized decision algorithms for handling large and complex rules	• Global consulting arm to support rules-based projects, particularly in Banking, Insurance and Healthcare
• Suppport for complex rules including very large decision trees	• Relies on underlying application server for high availability, performance and security needs	
• Single repository for all artefacts	• Full versioning support for all ODM artefacts	
• Rule validation and testing tools, including visual comparison editor		
• Sequential or optimized execution based on RETE-compliant engine		
• Rules invoked through proprietary API or as web services		

Figure 3: Summary of FICO's ODM support

IBM

IBM built some events and rules capabilities into its WebSphere product line as part of its service-oriented architecture (SOA) and Business Process Management (BPM) support, but it has expanded its portfolio with a number of acquisitions. IBM has now merged a number of these offerings into a single product outside of the WebSphere portfolio, IBM Operational Decision Manager (ODM). IBM ODM combines the functionality previously available in WebSphere ILOG Business Rules and WebSphere Business Events, providing a combined rules and events facility for building ODM solutions.

IBM ODM was reviewed by Lustratus previously, but while much of the functionality is unchanged there are some areas where there has been major change. In particular, ODM now provides a true Web 2.0 user interaction model for business users, which makes a great deal of difference to the speed and effectiveness with which business users will become engaged with ODM. This review reprises observations from the earlier assessment where appropriate, but has been updated to reflect the latest product changes.

Functionality

IBM ODM is actually split into two parts; Decision Server, the design and runtime tool for setting up and executing ODM projects, and Decision Center, the more business user oriented environment. Recently, IBM has provided Business Console, as part of the Decision Center, for authoring, editing and managing the sets of rules and events that make the decisions with a Web 2.0 look and feel. All assets are held in a common repository and can be shared between tools.

The Designer tool for setting up ODM projects is part of IBM Decision Server. The procedure starts with a developer defining the basic artefacts that will be part of the project; Designer is Eclipse-based with explorer-

style trees of artefacts. Classes are defined and models are built. There is a visual drag-and-drop style of interface too. Once completed, the assets can be made available in Decision Center, the non-technical, web-based business user tool that includes the Web 2.0-style Business Console, for authoring, viewing, editing and publishing rules changes. Business users can define and modify the required rules specifications in Decision Center, which offers an easy-to-use subset of guided menus and filtered lists of assets. Rules and events are listed together, with icons to flag which are events and which are rules. However, for Rules authoring, editing and management the preferred environment is the Business Console. The Business Console will be covered in more detail later in this section.

Selecting a rule artefact will put the user into an IF/THEN style of rule specification in plain language. If the user has a set of decisions that vary based on certain thresholds, then a decision table approach can also be selected to describe the decision-making differences. The same natural language approach is supported for the events specifications. The user builds tree structures of rules and sub-rules in order to manage and navigate projects inside the repository, and the same with events. All rule and event assets are stored in the same Decision Center repository, and can therefore be shared between other users. The events panel is slightly different because it can also have a rule embedded in it, or a call to an external rule. So an event specification might use IF/AFTER/THEN language to describe a simple rule to be executed if the event occurs, or it might call out to a rule artefact already developed.

IBM also offers an add-on component to Decision Center for enabling rules and events authoring and editing from Microsoft Office environments like Word and Excel; IBM Rule Solutions for Office. This makes use of a Microsoft Office plug-in to export rulesets from Decision Center into a special 'Ruledocs' file format that can be accessed from Microsoft Office tools. Rules can be edited directly from Microsoft Word, using a 'Rules' tab, and Decision Tables can be edited through Microsoft Excel through a 'Decision Tables' tab. Once the business user has finished making changes, the Ruledoc files can be resynchronized with the Decision Center repository for versioning and governance.

For business users, IBM offers the Business Console. This offers a completely different environment for rule authoring, editing and management that will be much more accessible and user-friendly to non-technical business users. For a start, whereas in the other IBM ODM development tools assets are always listed in hierarchical trees in an explorer style, in Business Console the user simply searches for the desired rule or rules using keywords, just as he or she would do today on any regular website. Alternatively, the user can look through rules that were most recently changed or that this user has 'subscribed' to as of particular interest, to review recent activities. Once the desired rule has been located, the user can now enter the editing environment to make the required changes. However, in typical Facebook style, users can post comments and reply to the comments of others to discuss possible changes, corporate policies, expert guidance or anything else related to a rule, decision table or project.

IBM ODM also comes with a range of test and simulation options, where for example the user can review the results a particular rule would deliver against historical or created data, and then compare that side by side with the results from the proposed modifications. This allows business users to quickly validate and enhance their ODM changes.

Deployment can be carried out from Decision Server or Decision Center, although of course the right level of authorization is required. This offers flexibility in the assignment of decision lifecycle responsibilities across line-of-business and IT organizations. As well as supporting versioning, IBM ODM also allows multiple versions to be compared and merged. Versioning does not have to be sequential either. Events defined in IBM ODM can access inputs from a range of different environments, such as Databases, Java applications, BPM, BAM or COBOL applications. When the rules/events combination is ready to be deployed, it can also be given start and expiration dates. Rules and events can be deployed in a range of different forms, such as Web Services, JavaBeans or message-driven components.

Measurement and feedback is provided at two different levels. IBM ODM provides the Decision Warehouse tool that is used for detailed queries about decision execution. Decision outcomes can be inspected within a range of different scoping factors such as specific date ranges and individual transaction instances. The report can include details such as which rules were called, when they were actioned, the version of the rule at that point in time and the outcome of the decision. IBM also offers Business Monitor for a higher level feedback environment, allowing executive dashboards and business metrics tracking at the operational level that incorporates decisions feedback.

Characteristics

The Business Console feature provides an empowering and non-threatening environment for business users to learn about and use the IBM ODM decision management capabilities. The collaborative, hand-holding approach makes it quick and easy for business users to pick up the skills, and ensures decisions can be made based on consistent and high quality input.

The ability for business users to use natural language specifications to create rule and event definitions, as found in all ODM solutions, is enhanced in the IBM case by two major additions. The first is that Decision Center combines rules and events, simply indicating the artefact type by a different icon. There is no need to step from one tool to another to define the rules and events that make up the decision functionality. The second is the provision of the ruledocs interface which greatly increases usability for business users who prefer to work with Microsoft Office products such as Word or Excel.

Time to value is improved through the enhanced usability, particularly for business users through use of Business Console. The ability to merge versions rather than have to operate with sequential versioning will also speed up time to value, and deploying business rules in the form of web services means that they can be consumed from a wide range of different environments and applications. Additionally, for IBM mainframe users there is specific support for integrating the ODM solution with existing COBOL applications.

The IBM ODM solution uses the IBM WebSphere Application Server (WAS) as its host for running rules and events, and as such the ODM solution inherits a lot of the scalability, security and performance attributes of WAS. This includes support for clustering, recovery, failover and other high performance options. Role-based security enables IT to offer business users more autonomy while maintaining control over system integrity, and the extensive testing and simulation capabilities acting against either historical site data or created input streams help to improve the quality of project delivery and service. Deployments can be made dynamically, provided of course that the right authorizations are in place.

Solution extensions

IBM offers a range of solution extensions. IBM Business Process Manager provides full business process management (BPM) capabilities, and ODM artefacts created with Decision Center can be utilized in these BPM process flows to make decisions in-flight. In a similar fashion, the ODM artefacts can also be consumed by the IBM Case Manager product. IBM also offers analytics capabilities within products like Process Center but also through the COGNOS and SPSS suites. Analytic needs for decision-making where heavy-duty streams of information need to be analysed quickly is provided by the complex event processing capabilities of IBM ODM, while SPSS brings predictive analytics into the decision-making process. In all cases, the analytics can be used to decide on the desired rules to be executed. Business Activity Management (BAM) is also integrated with the ODM solution through IBM Business Monitor, ensuring that decisions taken by event/rules combinations can be monitored and reported through the normal BAM dashboards and report-based feedback mechanisms.

At the moment, IBM has little in the way of industry-specific ODM samples or templates, but the IBM Blueworks Live community is already turning its attention to ODM, and it seems likely that the same sort of library of industry templates that already exists for business processes might emerge for decisions. However IBM has invested significantly in ODM-trained professional services teams across the world, with thousands of specialists available to support customer projects from planning to delivery. These teams not only provide

skilled ODM resources, but their experience has been distilled into IBM's ISIS (IBM Solution Implementation Standard) methodology for reference. Beyond the IBM fulfilment of resource needs, IBM also has a wide range of local business partners that can assist in specific geographical locations and with particular industry vertical challenges.

ODM from IBM

Functionality	Characteristics	Solution extensions
• Decision Center offers role-based rules and events development • Business users can use natural IF/THEN language or decision tables to build and modify rules and events • Business Console offers web 2.0 style collaboration and support for business users, while input from Microsoft Office applications is also supported • Test and simulation harness includes the ability to validate changes against historic data • Version control support includes merge functionality • Inputs can come from Java and COBOL apps, BPM and BAM tools	• Easy-to-use, collaborative authoring from Business Console or Office applications reduces skills requirements for business users • Dealing with rules and events in the same way and from the same tool increases time-to-value • Integration with COBOL applications enhances usability and productivity • Underlying IBM WebSphere application server engine delivers performance, scalability and security • Dynamic deployments are enabled through versioning and also merging of non-sequential versions	• Integration with IBM Business Process Manager enables processes to drive IBM ODM artefacts • Leverages Cognos and SPSS analytics capabilities • Integration with IBM Case Manager • WebSphere Business Monitor for BAM monitoring of ODM decision-making performance • Extensive professional services offerings and skilled resources • Broad partner ecosystem • Deployment of ODM artefacts as web services enables reuse by other components

Figure 4: Summary of IBM's ODM support

JBoss

JBoss is an open source community-based collection of middleware projects, run by RedHat and covering Java-based elements such as application and web servers, messaging tools and development environments. As is common in the open source world, the open source projects form the basis of a set of commercial products, delivered in this case by RedHat, and as far as this report is concerned the particular product of interest is JBoss Enterprise BRMS. Like most modern ODM solutions, JBoss Enterprise BRMS incorporates a CEP (complex event processing) engine to handle events as part of the decision management picture, but the JBoss offering also includes lightweight Business Process Management (BPM) functionality. While many companies involved in ODM also offer BPM products, it is unusual for BPM to be wrapped underneath the BRMS label.

Functionality

The productized JBoss Enterprise BRMS is based on the Drools community project focused on decision management. The main development environment is JBoss Developer Studio, the standard JBoss IDE. Within Studio, the JBoss Enterprise BRMS Workbench is the Eclipse-based tool for rules development. Workbench is built for Java developers, and uses the Drools Rule Language (DRL) developed by the Drools project for authoring rules. Rules are stored in a central repository, which can be any JCR compliant repository, with full version control. Workbench can also be embedded into third party IDEs if required. The basic constructs of DRL are WHEN / THEN pairs, and these are the only ones supported although RedHat says others will follow in the future. DRL is very much a programming-style language, and although of a very familiar form to programmers it is not something that the average business user would understand. However, wizard-like

'guided templates' can be constructed to make it easier for rule developers to specify those parameters that are likely to change most frequently, and this can be refined further by presenting a fixed list of allowable inputs.

For business users, JBoss BRMS offers a web-based authoring interface called 'Guvnor', which can either be used standalone or embedded into a third-party editor that supports Javascript. Guvnor primarily works with decision tables, although these can be customized to be guided and to restrict inputs to a limited set of options to make things easier for the business user. JBoss BRMS also supports Domain Specific Language (DSL) usage for language used within specific domains, but once again any use of a DSL for rules creation is restricted to the WHEN / THEN construct. There is also a plug-in for Excel, to enable decision tables to be manipulated from an Excel spread-sheet format. On the collaboration front, there is little support apart from use of a shared repository, some basic activity information such as recently edited rules and a comments facility that can tag comments to particular packages.

JBoss BRMS includes a CEP engine, allowing rules specifications to include temporal conditions. So for example, in the WHEN part of the rule construct, users can specify WHEN event A happens before event B, A meets B, A overlaps with B and so on. Rules can also specify 'sliding windows', where rules fire a set number of times or for a set period of time for example. There is little collaboration support for the rules development and maintenance tasks apart from the shared repository. Having said that, the web authoring tool, Guvnor, does provide some basic activity information such as recently edited rules and a comments facility that can add comments to particular groups of rules.

Once the rules for a particular project have been created, they are assembled into packages; it is these packages that are the deployment vehicles. Packages consist of related declarative rules, decision tables and knowledge agents that provide the facts on which the rules will operate. They are stored in the central repository, with versioning support for new versions. In addition to new versions, JBoss BRMS supports the use of Snapshots, which are read-only point-in-time copies of packages and which can also be deployed. JBoss BRMS includes rule validation and testing facilities. Validation includes aspects such as finding conflicts within packages and identifying gaps, for example where data is provided in the package but not acted upon by any rule. Testing can then be carried out based on sample data.

Execution involves deploying the packages in containers for consumption by applications running on a JVM capable of supporting JBoss Enterprise Application Server. This includes many Linux/UNIX combinations and Microsoft Windows. Applications use the JBoss Rules API to drive rules activity. JBoss BRMS provides some basic monitoring and management capabilities, but also offers a plug-in for the JBoss Operations Network which provides wider systems management and monitoring support.

Characteristics

Bearing in mind that JBoss products are based on open source community projects, it comes as no great surprise that the usability of JBoss BRMS is pitched at Java programmers. The JRL is very much a programmer's language, and even the guided templates expose a lot of technical constructs and details that aill probably confuse the average business user. In practice, the business user is almost certainly going to interact with JBoss BRMS rules solely through decision tables. The nature of decision tables, particularly with the guided aspects such as limited input selections, brings usage to a level that can be handled by business users, particularly from the Excel spread-sheet environment. In deployment terms, the package is a sensible combination of rules and decision tables, but the knowledge agents construct makes deployment complicated even for IT people. In fact, JBoss itself explicitly warns business users against trying to handle deployment themselves.

Time-to-value may be fine for small projects of simple rules, but the lack of sophisticated graphical modelling tools for complex decisions and the extensive up-front work required by IT developers before business user involvement is likely to cause difficulties. There is no import/export capability and little in the way of samples, although JBoss BRMS does support the use of domain specific rule languages in addition to DRL.

The JBoss BRMS runtime is a RETE-based inference engine that delivers high performance indexing and optimization, but beyond this the product relies on the underlying JVM environment to deliver the security, availability and end-to-end performance required. Governance support is limited, with fairly basic managing and monitoring capabilities, although rule execution information can be tracked and reported

Solution Extensions

The major solution extension for JBoss BRMS beyond the rules and event capabilities already discuss is the inclusion of BPM capabilities within the BRMS offering. This support is based on the JBoss BPM 5 project, and provides graphical process specification and management through the use of JBoss Developer Studio. Process flows can include rule and event specifications as required. However this BPM support is very much at the programming level, and although there is support for basic BPMN notation there is no support for BPEL for example.

Beyond this, RedHat does offer its JBoss BRMS Consulting services. These services include help with extracting rules from existing legacy applications, and migrating current rules specifications from other systems to JBoss BRMS.

ODM from JBoss

Functionality	Characteristics	Solution extensions
• Eclipse-based environment for defining events and rules • All rules based on WHEN/THEN, using the Drools rule language (DRL) • Guided templates can be developed to simplify rule editing • Browser-based tool and Excel plug-in for business users to interact with Decision Tables • Limited support for Domain Specific Languages (WHEN/THEN only) • Single repository for all artefacts • Rule validation, testing and versioning support • Snapshot tool to record point-in-time status of a rules package • JVM-based execution	• Very technical environment apart from browser-based decision table maintenance tool • Limited GUI-style capabilities • Reliant on underlying JVM environment for performance, availability, security • Basic monitoring capabilities, but also integration with JBoss Operations Network Monitor • Full versioning support for all ODM artefacts	• Complex event processor (CEP) built in, allowing WHEN expressions to involve event correlation across multiple applications • BPM support included, although with few graphical tools to assist and no BPEL support • Professional services limited to extracting rules from other environments and bringing them into JBoss BRMS

Figure 5: Summary of JBoss ODM support

Oracle

Oracle's decision management tools were featured in the previous competitive review of ODM tools carried out by Lustratus. Since the prior report was produced, Oracle has not made any significant changes to its offerings. This section reprises Oracle's offerings with some minor additions to reflect the odd changes that have been made since the last report was published.

Oracle still has a rather confusing selection of options for decision management support. The 'traditional' business rules capability is provided by Oracle Business Rules, shipped in both its SOA and BPM Suites. However, it also has a rules capability within its complex event processing (CEP) feature of the Oracle 11g database, although these rules are more targeted to data analytics operations. In addition, Oracle also has a couple of standalone, specialized options for decision management; Oracle Real Time Decisions (RTD), an

offering targeted at specific data mining/analysis opportunities in the CRM space, and Oracle Policy Automation, a Windows-based tool for building decisions from policy documents. All four options have different interfaces and functionality, in both development and runtime scenarios.

This assessment will focus primarily on the general-purpose Fusion Middleware-based Oracle Business Rules (OBR) offering, but the other three will be discussed as part of the section on solution extensions. As far as OBR is concerned, it is worthwhile reflecting on its history as this will affect much of the subsequent positioning. OBR has always been focused on Oracle's SOA and BPM capabilities. As a result, it is closely entwined with BPEL and higher level BPM flows. The business events part of the ODM equation is provided through the Oracle SOA Fusion Middleware toolset.

Functionality

Oracle offers both the business events and business rules capabilities that make up an ODM solution, although these are offered through separate products. Events are supported through the Fusion Middleware support for SOA composite applications, while Oracle Business Rules (OBR) is the offering for defining and deploying business rules. The rules development environment, Rules Designer, is an extension of the Oracle JDeveloper development environment, and is an Eclipse-based tool supporting role-based access. Through this role-based filtering, Rules Designer can ensure that business users can edit and update rules without being exposed to the technical complexities that need to be handled by IT staff. Events are also created in JDeveloper.

The technical OBR Rules Designer interface is used to define the data classes and models within which the ruleset will operate, as well as creating the initial rule definitions. Once this is done, the business user can now use the simplified Rules Designer view to adjust the rules as desired. Rules are either described in the 'IF / THEN' model, or for more complex rules that operate differently depending on thresholds of relevant values, in decision table mode. Oracle has also added support for decision trees for more complex rule development. The inputs to the ruleset can be imported from XML documents, Java, the Oracle ADF Business Components environment or direct from Java EE applications through a Java-like proprietary language called RL. In Oracle terminology, the combination of rulesets and their associated input definitions is called a dictionary. OBR stores all rule-related artefacts in a repository, providing an array of search and browse capabilities to enable users to find the related rules to their projects. Filters can be set up to ensure only the relevant rules can be seen. Event definitions by contrast are not made within OBR but are instead defined within the Fusion Middleware SOA environment, although still under JDeveloper. However, for broader system events, these can be defined within the Oracle BAM environment, which can also trigger a call to an OBR decision service.

Rule testing is somewhat limited at the moment. Oracle OBR provides a testing capability, but whereas rulesets can be created to operate with inputs from XML schema, Java, Oracle ADF Business Components and Java-based RL language sources, only XML inputs/outputs are supported in the test environment. The Oracle Rules Test Framework allows design-time testing of rules but only once they have been made into a Decision Function. Once this has been done, the Test Framework provides a mechanism to supply test data and creates XSD schemas to carry out the testing. Once created, these schemas will get updated as and when the decision function is updated, and they can be used to test any changes as required. Rule deployment is carried out from within Rules Designer. A 'decision function' is developed which is essentially a callable SCA-based service that can be invoked from Java applications via the Oracle OBR SDK, Oracle SOA Composer or BPEL flows. The OBR Rules Engine, running in the Java application server, provides runtime services to execute the decision service and return the response. Oracle events can call the decision function through the SDK, as can the Oracle ADF Business Components environment.

The Oracle BAM product provides monitoring and feedback on business rules and events activity, and includes various customizable dashboards and reporting mechanisms.

Characteristics

The Rules Designer interface makes use of personalized role-based views to help make it easier to use for non-technical business users. Once the tricky operations of creating the data model and putting initial definitions in place has been done by the developers, business users are presented with an easy-to-use IF / THEN structure of visual rule specifications. These are created and modified through a menu-driven approach, and the ability to filter the OBR artefacts ensures the business user is only presented with the artefacts the project needs. For more mechanical and repetitive rules that are dependent on input value thresholds, business users can also operate with a decision table structure. However there is little or no support for any sort of collaboration in building the various rulesets beyond the ability for developers and business users to share a common asset repository.

At the developer level, the Rules Designer tool guides developers through the necessary processes reasonably smoothly, and the RL Language offers a way for developers to invoke rules-based decisions from Java EE applications. It is easy to hook the rules into the main Oracle environments such as Oracle BPM and SOA, but access is limited to the world of Java-based applications. Events are designed in JDeveloper using Oracle's Events Definition Language (EDL), or through the use of the Oracle BAM tool for SOA-based applications. The BAM tool makes event specification fairly straightforward, but the native EDL route is more complex and technical.

Oracle ODM support is very much oriented to the Oracle Fusion world, but within Oracle's domain time to value is helped by the usability and model-based approach. Oracle does offer some samples to help, but these are extremely limited. However time to value could be impacted by the rather disjointed nature of Oracle events and rules support. Events support is offered as part of SOA and BPM implementations, while the rules specifications are kept separate. Admittedly, the rules can be invoked through the Oracle OBR SDK, but ODM implementation feels very much like two completely separate domains of events and rules.

The OBR Rules Engine is a RETE-based high performing, scalable implementation with a thread-safe architecture to allow analysis and execution operations in parallel. The RETE-based inference engine enables optimization by splitting large rules up into smaller parts. Rules Engine can leverage the Oracle application server technology in this area, and can also leverage Oracle CEP if required. Versioning is supported in that Oracle uses a standard XML repository for storing information, allowing users to implement versioning through a regular repository control system.

Solution Extensions

The first and perhaps most obvious extension for Oracle Business Rules is the integration with the Oracle BPM and SOA offerings. OBR can be used to provide the BPEL-style decision making that controls the linkage and flows between the various steps in the process or composite application. Beyond this, Oracle provides various levels of business analytics to help add value to its ODM offerings. The Oracle BAM tool can be configured to monitor decisions, tracking frequency and results for instance, feeding the information back in detailed reports or high-level executive dashboards. Also, Oracle Data Mining capabilities can be used from within the Rules Designer to investigate such questions as how often a particular rule would have been called based on historical data, and what decisions it would have taken.

Three specific solution extension areas, however, are Oracle Real Time Decisions (RTD) which is Oracle's branding of the Sigma Dynamics offering, Oracle Policy Automation and the Rules Manager CEP feature of Oracle 11g. While these are not actually extending the OBR form of Oracle ODM, since they are all implemented differently, these three offerings do provide ODM capabilities from different bases. Oracle RTD is an advanced and sophisticated approach to building a self-learning, intelligent form of decision management. However it is very limited in its applicability, and has really been designed for CRM scenarios. Oracle RTD offers its own design environment, Decision Studio, and is built around the concept of 'inline services' that will gather real-time and historic information based on certain resource specifications. This data is then analysed and can be used to feed back recommendations for particular decisions. An example might be a set of promotional offers that are

available for call centre agents to make to customers. By tracking such information as the number of times each promotion is offered and the number of times they are accepted, as well as the subsequent flow of business from the customer, Oracle RTD can be called by the Call Center client application during the customer contact process to recommend which offer to make in real time. The model is self-learning, since it changes its decisions based on historic data gathered continuously. However implementing this capability for other types of decisions will be hard due to the focused and specialized product design around the specific areas of offers and choices.

Oracle Policy Automation (OPA) is a Windows-based tool for mapping policy documents into ODM-style decisions. The product is essentially an outgrowth of the applications side of Oracle's business; as such, it has connectors for Siebel, Oracle CRM on Demand and SAP through an ABAP interface. The main components are a design-time toolset, Oracle Policy Modelling, for mapping Microsoft Word and Excel-based policy document into decision-making rulesets, and Oracle Policy Automation which encompasses the runtime components for deploying the ruleset execution across different platforms. Within its specialized set of use cases, OPA offers ODM-like productivity benefits. However it must be understood that these environments are completely separate from Oracle Business Rules; rulesets created with OPA can only be run in the OPA execution environment, and vice versa.

The Rules Manager CEP feature of Oracle 11g is also an ODM system of sorts, in that a set of events can be defined that are then detected by the CEP engine, with various different rules being implemented based on the results. However, this has been designed for use at the database level, and is not really suitable for more general ODM applications. While Oracle RTD and the CEP-based Rules Manager capabilities do offer extensions, the fact that they are all completely separate from Oracle OBR can be quite confusing.

Oracle offers a range of professional services and a network of partners, but these are all largely focused on product support rather than higher level planning.

The table below summarizes the salient points regarding Oracle's ODM support.

ODM from Oracle

Functionality	Characteristics	Solution extensions
• Rules development through Rules Designer, with technical and business user views	• Easy-to-use IF / THEN interface or decision tables	• Integration of Oracle Business Rules with BPM and SOA offerings
• IF / THEN and decision table views for rule creation and modification	• Inputs can be from XML schema, Java apps or Oracle SOA composite applications	• Analytics such as Oracle Data Mining avilable as part of ODM support
• Events configured using Oracle EDL	• Good scalability and performance based on Oracle application server technology	• Specialized Oracle ODM solutions for CRM applications (Oracle RTD), policy-based decision automation (Oracle Policy Automation) and database needs (Oracle CEP + rules)
• All artefacts stored in a common repository, with browsing and filtering options	• Versioning through standard XML repository versioning tools	• Professional services and partners are focused on product needs rather than higher level solutions
• Inputs to decisions may be XML, Java or other Oracle environments	• Rules and events can be deployed dynamically	
• Test environment only supports XML inputs/outputs		
• Deployed as a callable service, for use by BPEL, Mediator, Java EE apps		
• Monitoring through Oracle BAM, including dashboards and reports		

Figure 6:- Key characteristics of Oracle's ODM support

Contrasting the different ODM solutions

High level assessment

Operational Decision Management (ODM) is a relatively new market but is already getting an enormous amount of focus and attention due to its promises of agility, lower costs and improved customer service through increased decision-making accuracy. Business rules engines and event processors have been around for a long time, but ODM brings these together within a business context while at the same time making business rules accessible to non-technical business specialists to author, upgrade and manage. It is this last element of ODM that generates its powerful attraction, enabling business users to quickly and easily massage and optimize decisions dynamically to ensure they are always in step with the plans and goals of the business.

Each vendor in this review has approached ODM from a different perspective, and this greatly affects the final products they deliver. FICO has a long history of handling algorithmic calculations to support decision making, starting with its ubiquitous credit-checking service. It has expanded this algorithmic focus to encompass wider business rules, resulting in its delivery of FICO Blaze Advisor. As a result, its products have their roots in technical decision-making and optimization, and its heavy involvement with the Banking sector combined with its algorithmic focus has driven its support for large and complex rulesets. But it has little experience in the wider world of commercial transaction processing, and as such has not attempted to add broader functionality such as enterprise-wide events processing and correlation or BPM.

In contrast, IBM has a long history in transaction processing and online systems, and it is not surprising that it has therefore supplied ODM that brings together business rules with knowledge of events occurring throughout online operations within the enterprise. But beyond this, IBM seems to have made the mental jump to realize that the greatest returns from ODM come from being able to involve the business community, and it has made major strides in this direction with its Web 2.0 style of collaboration, providing the necessary support and confidence to business users that enables them to seize the opportunity with both hands. In Lustratus's opinion, this is the stand-out differentiator between all four offerings under consideration.

JBoss has been led by its community groups. The Drools project presented JBoss with a rules specification language, and it has eagerly adopted this. However, bearing in mind its interests in the whole middleware stack, JBoss was quick to integrate its offerings with the wider JBoss stack, and uniquely has chosen to include BPM and CEP underneath the BRMS label. However everything JBoss does stems initially from the community groups, and these groups are almost exclusively IT people; as a result, the JBoss offerings will always be built from a programmer's technical perspective, and the BRMS offering is no exception.

Finally, Oracle has the same sort of middleware background as IBM and to a lesser extent JBoss, but also has its applications business. As a result, it tends to approach new developments with a level of split personalities. On the one hand it provides a CEP for technical experts, and has added business rules as part of its BPM thrust. Since it knows business users need access to these rules, it has also added interfaces to try to shield the business users from the complexities of its technical environment, but its real business focus appears to be instead focused on specific domains related to its own application suite. Hence the Real-Time Decisions components, which are completely separate from the middleware-based BRMS support, are where it focuses on the business user most.

Summarizing, the high-level differentiation between these offerings is

- FICO Blaze Advisor offers a good tool for decision specialists to optimize and standardize mathematically-based algorithmic decision-making, particularly in the banking sector and other complex but rigid decision-making scenarios
- IBM ODM brings rules and events together, providing a solution that addresses a wide range of decision-making scenarios from tightly regulated environments like finance to the fluidity required in industries such as retail and customer service. The strong appeal to non-technical business audiences maximizes the effectiveness and overall returns of an ODM approach to decisions
- JBoss Enterprise BRMS is a broad package that is ideally suited to Java based organizations that have bought into the JBoss middleware approach. It will appeal to programmers and technical people, and with BPM and CEP included provides a powerful range of technical functionality
- Oracle Business Rules provides an easy-to-use interface for developing business rules that can be deployed in Oracle Fusion Middleware-based applications, although the JDeveloper interface may frighten off some business professionals. The events side of ODM will only be practical for programmers to use, limiting the overall appeal of OBR as an ODM solution. Its best fit will be for existing Oracle Fusion Middleware users, although the Oracle RTD and Oracle Policy Automation offerings may well appeal to users with projects matching their specialized functionality.

The buyer's perspective

The framework provided for describing the salient points of each offering was developed based on a technical landscape. However, for the competitive assessment of these offerings against each other, it is now important to switch to a more buyer-oriented perspective to give maximum value. Therefore, the detailed assessment will be done based on four main criteria:

- **Time-to-value**: How long will it take to complete an ODM project with this offering? When will the benefits start to flow?
- **TCO efficiency**: How will the total cost of ownership compare across the offerings? How much effort will be required to deliver, modify and maintain ODM projects?
- **Risk mitigation**: Can the required service levels be delivered and maintained? Will the project meet its business goals? How will exceptional situations be handled?
- **Value potential**: How much can be done with this ODM platform? How wide is the range of scenarios where it could help? Can functionality be extended to drive additional value? Can business value be optimized?

These areas will now be considered in turn, with the four vendors being assessed against each one.

Time to value

With the current worldwide economic conditions, companies are under enormous pressures to reduce costs and deliver more value – the 'do more with less' mantra. As a result, all projects need to focus very closely on both time to value and total cost of ownership. This section considers the vendor offerings being assessed in the light of the former, with the latter being covered in the next section.

ODM projects provide a number of different sources of value, but the most important are the business agility delivered by enabling business communities to quickly and easily author and edit decisions, and the intrinsic value in having decisions formalized in such a way that they are clearly visible for inspection. While technical activities are indeed required to set up ODM projects, the time-to-value focus is largely about the ease of use of the ODM offering in a business context together with the ability to validate new decision specifications and changes. A major issue here is that for many companies the area of operational decision management will be quite new, and employee maturity in the area is likely to start off low. This is one reason ease of use in a business user context is so key; minimizing education needs and empowering the business users will greatly enhance the extent of ODM usage and the speed with which benefits flow.

The four vendor offerings being considered differ markedly in this area. The JBoss offering will not present any usability problems to programmers, which to be honest make up the prime JBoss marketplace, but business user activities will almost certainly be limited to interaction with Decision Tables. FICO offers considerable ease-of-use for decision specialists, particularly in the heavily regulated environments of Banking, Healthcare and Government. Its expertise lies in making it possible to specify precise and complex decisions, and its broad range of graphical tools to support trees, tables, scorecards and native text-based rules will offer what the decision specialist expects. The wider business community will find the customized Rule Maintenance Applications a real help, but they are likely to still feel daunted by a general lack of rules maturity combined with minimal opportunities for supportive collaboration. Lack of events support is also a drawback.

The Oracle approach provides a BPM/programmer centric view of business rules through Oracle Business Rules, although the customized user views will help to alleviate the technical nature of OBR rules. However, as soon as events come into the ODM equation the Oracle solution becomes much more hostile to business users, with a different and more complex environment handling event processing needs. For users with needs that match the Oracle Real-Time Decisions (RTD) or Oracle Policy Automation offerings, a lot of the ease of use problems are mitigated by the provision of business user-oriented interfaces that should enable a quicker time to value. However, the discontinuity between these tools and Oracle Business Rules risks storing up usability problems for the future.

IBM made rather a slow start in the ODM space, not getting really serious until its acquisition of ILOG in 2009. However since then IBM has made impressive strides, and with its latest Web 2.0 style collaboration capabilities added to ODM it has moved well ahead of the pack in the areas of usability and time-to-value. Starting naturally from a technical perspective in a similar fashion to Oracle, IBM provides similar levels of technical tools for decision development together with a more customized interface for business users. Unlike FICO, IBM also offers events processing in conjunction with business rules to handle temporal needs, and its events support is much better integrated than that of Oracle for example.

However, the clever bit that provides the strongest differentiator in a time-to-value context is IBM's recognition that business user involvement and empowerment is key to generating ODM value. While all ODM vendors try to offer business users some sort of 'filtered' interaction with decision specifications, either by limiting the information presented to the user or by using more accessible decision constructs such as decision tables, there is still a problem in empowering business users and making them more productive; no matter how 'easy' the tool makes it, business users are always nervous about new IT functionality. The Web 2.0 style of Google-like searches and Facebook-like collaboration offers business users the equivalent of having a pool of experts in both the technology and the business domain sitting right next to them. As they are learning the new tool and its uses, they constantly have the ability to discuss what they should do with others. The effect of this added empowerment and enablement should not be under-estimated. It provides the confidence and inertia for business users to rapidly become productive, encouraging innovation rather than conservatism and generating greater business agility.

TCO efficiency

When comparing Total Cost of Ownership (TCO) factors between the different ODM solutions, the main focus will be on the training and skills costs, the ease of maintaining and updating the ODM implementations, any accelerators and templates to reduce on-going project costs and the ease of integrating the ODM offering with the rest of the IT environment.

At the technical level, the vendors under consideration all offer Eclipse-based tooling combined with the sorts of interfaces to make developers comfortable. However, the different rule constructs supported will still be new to IT staff. The most readily understood are probably the more text-based ones, and here the well-defined Structured Rules Language of FICO Blaze Advisor will prove reasonably familiar. JBoss Enterprise BRMS uses the Drools project creation, DRL, and this provides users with an additional opportunity to reduce longer term TCO through the ability to feed changes back into the project and then hopefully into the product itself. The IBM

developer interface will not be a problem for most, and the Oracle tools will be fine for IT users familiar with JDeveloper and Oracle ADF, although ADF in particular can be a steep learning curve for new users.

However at the business level there are much greater differences that will affect training and skills costs and hence overall TCO. Starting with the JBoss offering, this tool is basically a programmer's tool. It does offer business users a browser-based interface and an Excel plug-in that supports decision tables, but this is really just a cosmetic layer – the whole look and feel of JBoss Enterprise BRMS is a technical product, making it a challenge for business users to learn and use. As far as Oracle Business Rules is concerned, although the interface for rule authoring and updating is more business user friendly, as soon as events come into the ODM equation it becomes a real struggle for business users. Having said that, the Oracle RTD and Oracle Policy Automation offerings provide specialist ODM solutions that are much easier for business users to understand and customize, providing interfaces that are more in tune with business user domain expertise. But of course these solutions are only applicable in a subset of use-cases.

FICO Blaze Advisor is a bit of a mixed scenario. The tools for decision development are sophisticated and powerful, able to handle immensely large and complex decision processes. The graphical decision trees viewer offers particular assistance for these complicated implementations. But when stepping outside of the more visual decision constructs like decision tables or trees, the proprietary rules language, SRL, is indeed powerful but it is quite difficult to understand because it is very structured and therefore very intolerant of variation. The syntax and format has to be precise. Having said that, business user interfaces can be made more accessible through the use of the customized Rule Maintenance Applications (RMAs). In addition, for users requiring specific rule-based solutions such as fraud detection or debt management, the preconfigured packages offer a way to greatly reduce skills and training needs, thereby decreasing TCO. In essence, the FICO solution will fit well with the community of rules specialists working in rule-heavy environments, but for wider business user usage significant education may be required, although the RMAs can help to mitigate these costs.

For business users, IBM's Web 2.0 approach offers the ODM environment with the lowest barriers to entry. For instance, rather than having to know which element in an explorer-style hierarchical tree of assets contains the rules to be maintained, as is the case in the other products assessed, in the IBM case the business user can simply search based on the relevant keywords. The normal graphical decision constructs are offered to the business user, and the text-based language is simple to understand, but the ability to easily interact with other experts about what the user is trying to do, or how it should be implemented, makes on-the-job training easy and productive.

As soon as users want to create decisions that are dependent on what else is happening in the enterprise, events processing comes into the ODM equation, and this has another impact on training needs. FICO does not support any form of Complex Events Processor (CEP), providing only a primitive mechanism for users to program their own 'event' points in the applications. Oracle's events support is powerful but the usability is frankly very poor; it requires a completely separate environment and knowledge of Oracle ADF which is a complex product. For companies wanting to implement events as part of ODM, the Oracle solution will require a lot of training and time, impacting TCO. The other two vendors, JBoss and IBM, have embraced events as part of ODM more effectively. In JBoss Enterprise BRMS the CEP can process events and be brought into the rules as part of the WHEN expression, although the language to do so is rather complicated. IBM has the best incorporation of events, providing the same language and a similar interface to create events that then trigger specific rules or rulesets. However from a business user perspective there is a major drawback here; while IBM offers powerful Web 2.0 collaboration for rules development, this is not yet provided for events creation. Instead, events are built in the more traditional way.

All vendors assessed offer central storage of assets with version control, with rollback to get back to a previous version if required. JBoss and IBM also offer a point-in-time snapshot function. All these capabilities help to reduce ongoing TCO costs. In terms of integration, the biggest area affecting TCO is the support for legacy systems. For organizations with COBOL applications, only FICO and IBM provide specific support for extracting

rules from COBOL applications or sharing rules with them. The other two vendors would require a much more manual process to address ODM needs where COBOL applications are involved, increasing TCO substantially.

Risk mitigation

Part of any product selection process is an evaluation of risk. The main focus is usually operational risk, although some elements of financial and strategic risk do come into the equation, for example when the likely longevity of a vendor is considered. When assessing ODM solutions, the focus is usually on elements such as how well the delivered project will fulfil business expectations, whether service levels will meet criteria, what mechanisms are offered to preserve these service levels and how restrictive the solution is in terms of future product and technology flexibility.

As far as meeting expectations is concerned, to a large extent this depends on what the user expects of an ODM solution. Starting with FICO Blaze Advisor, the user needs to be clear that this is a BRMS being used for decision management. There is virtually no events-based support to be factored in. As long as the user is clear on this, then the FICO solution is mature in the way it deals with rules and in particular the more complex, algorithm-based types of rules. The preconfigured rules solutions offered by FICO ensure a close match with the relatively limited set of requirements they are designed to satisfy. JBoss Enterprise BRMS will almost certainly only be adopted as part of an investment into wider JBoss middleware, and within this context the technical bias of the product will probably meet expectations. The Oracle Business Rules offering is probably the most susceptible to missing expectations due to the confused nature of Oracle's overall ODM approach. Not only are events handled in a completely different fashion to rules, but decision support is offered by a number of other products as well as Oracle Business Rules, such as Oracle Real-Time Decisions and Oracle Policy Automation. In contrast, IBM ODM's ease of use and accessibility for business users together with its integration of rules and events is likely to ensure a close match between expectations and reality.

All vendors provide rule testing, verification and simulation functionality. It is surprising that Oracle Business Rules only supports XML inputs in its testing, but beyond that the functionality offered in these areas is not wildly different across the different vendors. On the monitoring front, however, there are differences that could affect risk. While each vendor offers a level of monitoring support to track rules invocation and decision results, Oracle and IBM provide a much more complete BAM solution that can bring in inputs and alerts from the ODM component, providing a more comprehensive level of monitoring functionality.

Performance, availability, scalability and security are all key areas of risk mitigation. To a large extent, these characteristics will depend on the underlying operational environment such as JVM or application server. However there are differences to be noted. For example, availability is closely related to ease of use, since a major source of outages is user error, and on this basis the IBM offering with its enhanced usability for business users scores highly. FICO's preconfigured options and Oracle's specialist solutions also help to reduce the risk of outages. Beyond this, FICO Blaze Advisor has a reputation for being able to handle extremely complex and calculation-intensive rules execution efficiently. Its optional mode of execution based on input from its inference engine enables it to quickly optimize these complex rule structures, although care must be taken to preserve sequencing where required. The IBM and Oracle solutions both offer powerful execution environments that can handle large volumes of rules execution if required, and in particular for event-based processing the CEPs offered by the two vendors provide highly optimized and efficient filtering and correlation of events from many different sources.

There is one final point to make on the subject of risk. While JBoss is a well-established brand, it must be remembered that in the end it is based on a set of Open Source community projects. While there seems little danger of JBoss vanishing overnight, there is no doubt that in terms of a commercially-based risk evaluation, this makes JBoss less attractive than other vendors that have their own R&D organizations.

Value potential

This section looks at the overall value potential of each vendor's ODM offering beyond basic ODM functionality. Starting with the closely related areas of service-oriented architecture (SOA) and business process management (BPM), IBM, Oracle and JBoss all offer SOA tooling and an overall middleware infrastructure for developing SOA-based applications. JBoss Enterprise BRMS actually includes BPM functionality, while IBM ODM and Oracle Business Rules both integrate with their own SOA platforms and offer separate BPM products. By contrast, FICO Blaze Advisor is a pure-play BRMS solution with no additional SOA or BPM capabilities. Having said that, Blaze Advisor has third party relationships with companies such as Software AG and Oracle to allow it to fit in with their SOA and BPM solutions. IBM, Oracle and JBoss also offer CEP-based events processing that can be linked with rules to form decision solutions that can react to wider occurrences throughout the enterprise. Once again, FICO does not offer any support in this area.

Analytics is another closely related area to decision management. Decision quality generally improves in proportion to the extent and accuracy of the information provided, and analytics can play an important role in getting the most out of corporate and production data to support the decision making. JBoss Enterprise BRMS has only the most basic analytics capabilities, but in contrast FICO offers a number of specific offerings that are designed to help with building complex and accurate algorithms, particularly in the banking arena. These tools can analyse data to come up with the optimal rule specifications, and are particularly strong at predictive analytics. Oracle has a number of specific analytical tools such as its Oracle Data Mining facility, but these are more closely related to Oracle database activity than ODM effectiveness. However, Oracle also offers comprehensive business activity monitoring (BAM) functionality that can provide another useful source of analytics based on operational performance. IBM offers a wide range of analytic tools, such as COGNOS and SPSS, providing historic and predictive analytical intelligence. The IBM tools can provide analytics based on a wide range of factors, including not just internal operational performance but external factors such as social influence and reach in the wider Web 2.0 sense.

In terms of specific ODM industry solutions and templates, both FICO and Oracle provide some preconfigured and customizable rules-based packages and applications. Oracle Real Time Decisions (RTD) is designed for CRM decision management scenarios, while FICO offers a range of preconfigured solutions for use-cases like fraud detection, debt management and claims management. IBM offers integration with its IBM Case Manager offering, allowing case management applications to call IBM ODM rules and events to decide on the relevant execution paths.

Because ODM is still a relatively new discipline, companies are often interested in getting help and guidance on their decision management projects in the form of professional services. The four vendors considered in this assessment differ widely in this area. As might be expected from a product based on an open source community project, JBoss provides a very limited set of consultancy offerings, largely geared around bringing rules into JBoss Enterprise BRMS from existing applications or other BRMS solutions. JBoss does not offer any of the higher level guidance on decision management to assist with areas like planning, design or optimization. Oracle offers a range of professional services, but these are usually more focused on bringing ODM together with its own Oracle application suite. IBM and FICO both offer much more extensive ODM-focused services. FICO has extensive experience of business rules implementation, particularly of the algorithmic kind in its prime focus industries like Banking and Healthcare. However, FICO is still quite new to the 'Operational' aspect of ODM - bringing the power of rules into online production operations. Therefore it has not had anywhere near the same experience with SOA or events processing. This is a major difference between FICO and IBM in terms of practical expertise; IBM has extensive experience of implementing online solutions incorporating technologies like BPM and SOA, and it brings these together with its growing knowledge base of decision management and wider analytics to offer a broad and deep set of professional services around ODM.

Summary

Operational Decision Management is still a relatively new innovation, although the underlying components of rule and event management are well tried and trusted. The trick is in bringing these technologies into a business context that can stand the pressures of being deployed in an operational run-time environment. But the major goals of ODM remains the same – generate improved service quality and conformance through embedding corporate knowledge and expertise within easily deployed, reusable components, and enable business agility by placing control of these decisions-making components directly into the hands of the business users.

The first of these two objectives is a classic technical challenge and has been addressed fairly consistently by most ODM offerings. Some vendors coming from the BRMS world have been slower to understand the implications of decision management in an operational environment, for example not paying enough attention to events processing as an adjunct to rules specification, while others have implemented ODM as a natural extension of their existing operational processing infrastructure, often SOA-based. But it is the second goal that has seen the greatest differences between different vendor solutions.

The challenge of making ODM accessible to business users has proved a harder one to tackle, largely because the ODM vendors tend to all come from a more technical perspective. And yet, it is only by enabling business users to confidently and productively update and author decisions that ODM value can be maximized. Without this, ODM becomes little more than a programming aid. But with it, decisions can be changed as and when the business demands, quickly, accurately and effectively, while at the same time business users have the opportunity to innovate and optimize decision making to generate greater efficiency and returns.

All four vendors assessed have provided reasonable functionality to build and maintain decisions. A thumbnail summary would be that FICO Blaze Advisor is very good at fairly rigid, complex, standalone decisions where there is little interaction with other activities in the enterprise, JBoss Enterprise BRMS provides a useful tool for programmers to implement some time-saving decision-making components, Oracle offers all the functionality you need as long as you can work out how to put it all together, and IBM delivers powerful support across the board for implementing true operational decisions, particularly in conjunction with an SOA model. But Lustratus believes the stand-out differentiator across the four vendor solutions considered is IBM's Web 2.0 enablement of the business user. Finding the decisions you want to work on is just a question of a Google-style search; editing decisions is in an understandable language or uses visual constructs like decision tables; and collaboration facilities empower the user by offering Facebook-like comment streams with other domain experts. With one swipe, this moves ODM from being something business users may use with a certain amount of trepidation and conservatism to a non-threatening, supportive environment that empowers business user productivity and innovation.

Lustratus expects all ODM vendors to eventually embrace the power of modern Web 2.0 techniques in the future. However, until that happens, Lustratus believes this latest development has placed IBM clearly in the lead in the field of Operational Decision Management.

	Time to value	TCO efficiency	Risk mitigation	Value potential
FICO	■■■■■■■■□□	■■■■■■■■□□	■■■■■■■■□□	■■■■■■■□□□
IBM	■■■■■■■■■□	■■■■■■■■■□	■■■■■■■■□□	■■■■■■■■■□
JBoss	■■■■■■■□□□	■■■■■□□□□□	■■■■■□□□□□	■■■■■■□□□□
Oracle	■■■■■■■□□□	■■■■■■■□□□	■■■■■■■□□□	■■■■■■■□□□

Figure 7: Competitive summary of ODM solutions from FICO, IBM, JBoss and Oracle

About Lustratus Research

Lustratus Research Limited, founded in 2006, aims to deliver independent and unbiased analysis of global software technology trends for senior IT and business unit management, shedding light on the latest developments and best practices and interpreting them into business value and impact. Lustratus analysts include some of the top thought leaders worldwide in infrastructure software.

Lustratus offers a unique structure of materials, consisting of three categories—Insights, Reports and Research. The Insight offers concise analysis and opinion, while the Report offers more comprehensive breadth and depth. Research documents provide the results of practical investigations and experiences. Lustratus prides itself on bringing the technical and business aspects of technology and best practices together, in order to clearly address the business impacts. Each Lustratus document is graded based on its technical or business orientation, as a guide to readers.

About Lustratus REPAMA

Lustratus REPAMA is the marketing consultancy and competitive marketing intelligence division of the analyst firm Lustratus Research Limited. Whilst Lustratus Research provides detailed technology analysis, reports, insight and advice aimed specifically at end users of technology; Lustratus REPAMA helps technology vendors to better compete in their markets.

The REPAMA research methodology is central to Lustratus' consultancy services and provides a detailed map of the go-to-market strategies of the vendors in a particular market segment. We represent these strategies and tactics graphically as well as textually which makes it simpler to compare vendors' strategies and to identify strengths and weaknesses.

REPAMA is an acronym formed from the phrase Reverse-Engineered Positioning and Messaging Analysis. Lustratus REPAMA services clients worldwide from its base in the UK. http://www.lustratusrepama.com/.

Terms and Conditions

Lustratus Research Limited

St. David's, 5 Elsfield Way, Oxford OX2 8EW, UK

Tel: +44 (0)1865 559040

www.lustratus.com