

WHITE PAPER

The Business Value of Business Rules Management Systems

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IDC OPINION

The business rules management system (BRMS) market is having a transformative effect on how organizations think about IT and address application development needs. Organizations are adopting far more structured approaches to application development because of the increasing mission-critical importance of IT and the accountability that organizations have to their customers. Additionally, organizations are increasingly looking for ways to better serve existing customers and attract new ones. The most common way to better serve customers is to better address the individual needs of each customer. Today's approach to IT is the antithesis of Henry Ford's approach to customer service — "any color you want, as long as it's black."

Today, IT is about the alignment with business needs, agility, flexibility, governance, availability, reliability, and efficiency across the entire software development life cycle. These attributes account for the transition to deployment technologies, configuration-based development, and the adoption of service-oriented architectures. When we extrapolate on these trends, we find a common thread regarding the role of BRMS. Because BRMS technology is well equipped to address current decisioning needs and is aligned with the future direction of the industry, we see significant opportunity in the BRMS market. This opportunity is based on the history of BRMS delivering value today as well as its potential for transitioning from a construct for application development to a primary engine driving application development.

While this may seem like overly optimistic thinking to some, our primary research and interviews of BRMS users highlighted in three case studies show a pattern of BRMS use and value that is compelling.

IN THIS WHITE PAPER

This white paper leverages IDC primary research and buyer-focused research to derive an understanding of the business value of business rules management systems. This document synthesizes data from 30 interviews to establish the key drivers for using BRMS technology. Three case studies are presented that not only put these drivers in context but also identify challenges and best practices in using IBM's BRMS technology. This paper concludes with a brief discussion of where the IT industry is headed and the role of BRMS technology in the transition from process-centric to decision-centric application development.

SITUATION OVERVIEW

Business rules management systems have gained tremendous acceptance over the past decade. A recent IDC survey of IT managers showed that 55% were using BRMS technology and 16% of those using a BRMS were planning to increase their usage. The BRMS market exhibited double-digit growth each year of the 2008–2010 period, making BRMS one of the leading growth areas across all application development and deployment tools. The majority of this market growth is tied to IBM's acquisition of ILOG, which provided the JRules BRMS with an expansive installed base of new customers to sell into.

Business rules have come of age largely because of the growing importance of decisioning as well as the ability to more precisely tailor decisioning based on market segment or changing demand patterns. This increased precision in decisioning enables organizations to more effectively address the changing needs of a much larger and heterogeneous constituency. BRMS technology enables decisions to be separated from actions, thereby providing far more flexibility in identifying what action(s) to take. This allows decisions to be far more responsive to changes in data and state and enables more precision regarding what actions to take.

The business value of using BRMS is now quite clear. IDC interviewed 30 end users whose products rely on BRMS technology. In analyzing these interviews, we identified four key themes regarding the BRMS market and IBM JRules: performance, maturity, agility, and governance. While agility was the most frequently mentioned characteristic of BRMS products, performance and maturity held more significance for users. This emphasis on performance and maturity largely reflects the mission-critical role of JRules in the enterprise.

IBM rebranded the JRules BRMS in October 2011 as WebSphere Operational Decision Management. This rebranding was based on the integration of the JRules BRMS with IBM's WebSphere Business Events product, creating a combined business rules and events management platform. While the customers referenced in this paper are noted as using the JRules BRMS, all the capabilities and benefits described continue to be available in the WebSphere Operational Decision Management offering.

Performance

Performance was a frequently cited benefit associated with using JRules. In absolute terms, customers are clearly impressed with the performance of the JRules engine. "The ability to define thousands of objects, present these to the rule engine, and receive decisions back in fractions of a second" was one of the customer quotes that best sum up user experiences. Most of the reason for these performance gains stems from JRules' RetePlus execution mode, which allows rules to better leverage working memory.

In relative terms, BRMS applications also easily outperform the legacy applications that they are replacing. Often, the legacy system becomes data bound, meaning that increasing database I/O, indexing, or reorganization necessary to support traditional decision making simply extracts a performance penalty that becomes untenable. By switching to a rule-based approach to decisioning, applications can support more complex decisioning while also delivering higher performance and maintainability.

Maturity

Reliability and stability were the terms most often used to describe JRules. Customer comments included "It just works" and "It doesn't break." IBM, through ILOG, was one of the pioneers in the BRMS market, and its focus on continuous improvement has yielded a product that is generally bulletproof as well as feature rich. Product maturity is especially important because astute decision making drives effective actions. Today, it is critical that corporate policy can reliably be made actionable and at the same time can ensure decision completeness, consistency, transparency, and governance. Only the most mature BRMS products provide capabilities that address these requirements.

Agility

Agility is the combination of ease and speed with which the behavior of applications can be changed. A frequently cited benefit of JRules is the speed with which rules can be changed. Cycle time, or the time it takes to implement changes to an application, is dramatically reduced by using JRules. This reduction in cycle time is achieved by implementing a dedicated rules authoring and execution environment that is loosely coupled to processes (actions). Loosely coupling decision and processes leads to more opportunities to build more speed and precision into the decisions and behavior of an application. This enhanced speed results from rules that can easily be changed or extended. Improvements to precision mean more specificity regarding what processes or actions to take. The net is an application that can deliver far more precise behavior to a more heterogeneous group of users in far less time and with far less effort. One of the more compelling statements that we heard regarding the use of business rules is "Changes that used to take us six months can now be done in a week."

Governance

Governance is increasingly becoming a guiding principle for IT activities. Organizations want to express policy and then ensure that this policy is administered reliably. Simultaneously, organizations want to ensure that they are in compliance with any regulatory conditions that exist for their market, industry, or enterprise. Leading BRMS products such as JRules have the ability to show what decisions support a particular action at any particular point in time. This is a key capability because policy and regulations are continuously changing.

A commitment to BRMS technology represents an important evolutionary milestone for most IT organizations. BRMS applications are data driven and reflect a structured and organized approach to application development. The exercise of having to verbalize business rules and associating these rules with actions requires organizations to have a deep and clear understanding of their business. Organizations find this an enlightening and valuable experience that leads to more complete and consistent application development. Consequently, organizations that embrace BRMS technology will find themselves in a far better position to align IT with the needs of the business.

CASE STUDIES

The following case studies span different vertical industries and describe a variety of use cases for BRMS technology. However, the cases share certain characteristics, including the need to make decisions in real time and provide robust support for mission-critical activities. Also common to each of these case studies are requirements regarding performance, agility, maturity, and governance (selectively).

Equifax

Equifax manages a nationwide consumer credit data repository. Combining its large repository of consumer and commercial data with analytics and technology enables Equifax to deliver reliable and customized data insight to its customers. Equifax delivers a wide range of solutions — including consumer and business credit intelligence, fraud detection, portfolio management, and decision technology — to business and financial institutions of all sizes. Consumers can also use Equifax products to manage their personal credit history as well as protect their identity.

Equifax provides real-time decision services for over 1,000 customers. It needed a tool that could be used by its business users to define customer risk policies. All of these business users needed the capability to define a risk management policy that would be specific (customized) to their needs. Additionally, the tool selected would need to have strong change management capabilities so that changes to customer policies could be easily modified. Equifax settled on BRMS technology to drive decisioning for this tool because of its decision focus; alignment in supporting governance, risk, and compliance (GRC) initiatives; and agility in changing business rules.

Equifax selected IBM's JRules because it has been a consistent leader in the BRMS market for many years, and at the time Equifax made its tool selection (2002), it felt JRules was the best product on the market. The IBM technology would also allow Equifax to replace a legacy application with hard-coded rules that simply could no longer be maintained with the speed and reliability demanded. Equifax also was very willing to work closely with IBM regarding desired improvement to the JRules change management capabilities. This was because Equifax was collectively experiencing a very heavy volume of rule changes every year as customers continuously modified their risk profile in response to changing market needs.

The strongest but least visible attribute of JRules is the reliability of the business rules engine (BRE). When asked about this reliability, Equifax was very direct in its response, stating, "It just doesn't break" and "Integrity of execution has been pretty much flawless." Equifax also found the performance of the JRules BRE satisfactory. Decision response times are typically under a hundred milliseconds and reach one to two seconds only on rare occasions when evaluating massive decision tables. Equifax feels that over the eight years it has been using JRules, the product has become far more comprehensive, especially in the area of change management. Authoring and change management in JRules can also be performed by business analysts, which allows the people with the best understanding of policies to define and maintain them. This approach enhances agility and is a more efficient way to keep business rules up to date than having to schedule IT professional

developer time. The rule authoring environment was sufficiently configuration based that Equifax could also allow its customers to make changes.

One of the most interesting challenges that Equifax faced in implementing JRules was training users to think more declaratively than sequentially. Business users were used to thinking procedurally regarding decisions and process. JRules provides a more intuitive and business-focused authoring environment where users think about discrete events, conditions, and actions because the IBM BRE automatically sequences the rules. Despite its advantages, this approach to rule authoring remains somewhat challenging for users.

Equifax's experience in using JRules has led to an interesting best practice. The data-driven nature of decisioning requires careful attention to data modeling. Data needs to be accessible and reliable in order to ensure the accuracy of decisions. Equifax addressed this by establishing clear and comprehensive enterprise taxonomy. Once this taxonomy has been established, policy regarding change management and testing can be expressed more concisely.

At this point, Equifax is a long-standing JRules customer and continues to be satisfied with how the technology has evolved under the care of ILOG and IBM. Equifax has observed an increasing desire on the part of its customers to develop more granular and complex rules. JRules takes this added rule process burden in stride as long as IT monitors response time and adds memory and CPU as required. Equifax's satisfaction with JRules also stems from the fact that both risk management and fraud detection are applications that are inherently decision centric, making JRules an ideal choice for addressing customer needs in these areas.

PMI

PMI is a public company that provides credit enhancement solutions. PMI insures mortgage originators when new homebuyers make purchases with down payments of less than 20%. Serving the needs of lenders, investors, and borrowers, PMI provides risk management and loss mitigation through the use and application of leading research, analytics, and pricing principles. PMI's mission is to foster sustainable home ownership. This allows first-time homebuyers to purchase their first home earlier and helps protect against foreclosure. PMI was founded 35 years ago and is headquartered in Walnut Creek, California. PMI comprises The PMI Group Inc., PMI Mortgage Insurance Co., PMI Europe, and CMG Mortgage Insurance Company. Revenue for The PMI Group in 2010 was \$641 million.

Like most companies, PMI needs to adapt quickly to change in order to remain competitive. PMI was looking to provide its IT-based products and services "better, faster, and cheaper." IBM addressed these goals on a number of fronts with IBM WebSphere ILOG JRules BRMS. This case study discusses a variety of important ways that PMI derived value from JRules. Some of the more interesting findings are as follows:

- ☒ JRules enabled PMI to dramatically reduce the training time frame for new Rates Authors who are the business experts. Training time was reduced by a factor of six, going from one year to two months.

- ☒ Implementation of JRules reduced the number of business rules required to execute business processing, which streamlined guideline administration. These benefits translated into a 20–30% faster time to market, with underwriters being able to author rules.
- ☒ JRules provided a newfound ease of extensibility with new rate structures. PMI has found that in using JRules, it is better positioned to support the rapidly changing guidelines that are an integral part of its business.

PMI has been using JRules since 2007. When PMI began looking for a product to address its BRMS needs, it considered several leading products. JRules was the clear winner of this process for a number of reasons. One, JRules was a good fit for its technology stack, which is JEE centric. Two, PMI is highly focused on application quality, which has led to the adoption of a comprehensive application life-cycle management policy. PMI routes an application through development, quality assurance, staging, and then production, thereby enabling it to fully understand the impact of deployment from quality and performance perspectives. ILOG's platform for application development and deployment was seen as well aligned with PMI's life-cycle needs by offering platform components that addressed design (Rule Studio for Java), development (Rule Team Server), and deployment (Rule Execution Server) — all supported by an underlying rule repository. Rule Team Server was viewed as especially effective at aligning with life-cycle needs because it provides a collaborative environment for authoring, validating, managing, and deploying business rules. The upshot was that the technology and governance that JRules brought to the table complemented its existing application development life cycle and operations.

PMI has found that the use of JRules represents a marked improvement in how it pursues application development. With JRules, PMI has witnessed reduced development time as well as accelerated deployments. These improvements stem from the ability to consolidate four software development "roles" into a single rule authoring role. Business users have been empowered with the ability and responsibility for authoring business rules, which streamlines policy definition, increases quality, addresses a critical dimension of governance, and frees up IT to address activities better aligned with its expertise, such as responsibility for technical implementation of interfaces, the object model, and quality assurance. PMI has found that JRules provides increased agility and transparency in the authoring, deployment, and management of application decisions. PMI estimates that it has recognized a 20–30% time savings in moving its products from requirements through implementation. This agility is also perceived as a competitive advantage because of the increased speed with which PMI can introduce new rate structures and policy changes. PMI stated, "ILOG has been critical to our ability to adjust and adapt to the changes in the market."

Interestingly, PMI has also found that it has reduced the number of rules that need to be written, which reduces overall product development effort with the benefit of underwriters authoring business rules. Because JRules provides a clear separation of decisioning concerns, PMI is able to consolidate and better rationalize rule definition, which eliminates rule redundancy. PMI's use of JRules for rule development and execution also has the derivative benefit of creating an audit trail around rule execution and reporting. A key feature of JRules rule development is rule validation services.

PMI leverages these rule validation services to ensure that the business changes introduced to meet changing market needs do not lead to unintended decisions.

When asked what the best attributes of JRules are, PMI put performance at the top of the list. PMI reported that it receives millisecond response times despite operating tens of thousands of rules, indicating high levels of rule scalability. PMI indicated that this is also accompanied by very high levels of availability and reliability of Rule Execution Server. Another best attribute voiced by PMI is the usability of JRules for business analysts. An added and welcome benefit of JRules is its rule governance model for change and version control.

A number of best practices have emerged at PMI based on its use of JRules. PMI built out its business object model with more attributes than it anticipated would be needed. The upshot of this strategy is that the rule authors can choose new attributes from the model without having to change the interface. The resulting benefit is high flexibility in the types of rules that can be authored. PMI has also found that it is important to establish solid governance that conforms to software development best practices. This includes creating and documenting standards for naming conventions and packaging rules. Another key area is the automation of quality assurance, validation, and deployment processes and the establishment of a formal change/version control methodology. PMI already has a very strong process in place for this and a robust set of regression tests to ensure production quality. While organizations are putting these practices in place, it is equally important that they conduct periodic audits to ensure that proper policies and standards are being met. Finally, PMI recommends that organizations start with a small-scale rules implementation and learn JRules well before moving on to larger application development projects.

When queried regarding the challenges it encountered in using the JRules product, PMI chose to approach the question as "opportunities for improvement." PMI would like to see the JRules Business Action Language be more user-friendly. This would allow PMI to extend rule authorship to a wider audience of business authors. This is a company goal, and PMI is hopeful that ILOG will get there in its next release. Other challenges that PMI faced were not ILOG specific but more a result of shifting to a BRMS tool. One of those challenges was allocating sufficient time to scope object model and decision service requirements. Another challenge PMI encountered was that migration to a BRMS often necessitates application refactoring. This is due to the more structured approach to application development that is enabled by a BRMS. While this architectural change was perceived as beneficial by PMI, it represents a change to how IT applications are developed.

Looking to the future, we asked what changes PMI would like to see in JRules. Similar to its response to the challenges it has encountered with the product, PMI would like to see greater flexibility in the rule authoring. Specifically, PMI is interested in a more flexible rule authoring language that enables the rule authors to use their own synonyms when authoring rules.

As we concluded our interview with PMI, the company indicated that it is "very, very happy with the usability, performance, and support on the product" and that JRules has "exceeded our expectations." PMI believes that JRules has been an excellent fit

for its organization as far as the capabilities of the tool and the functional requirements that it has from a business perspective.

About The PMI Group Inc.

The PMI Group Inc. (NYSE: PMI), headquartered in Walnut Creek, California, is a provider of residential mortgage insurance and credit enhancement products. Its wholly owned subsidiaries, PMI Mortgage Insurance Co. and PMI Insurance Co., are currently under regulatory supervision and engaged in the runoff of their existing in-force insurance portfolios. PMI Mortgage Insurance Co. is also a 50% owner of CMG Mortgage Insurance Company, which provides mortgage insurance specifically to credit unions. For more information, see www.pmi-us.com.

RCI

RCI is a leader in exchange vacations for people who own one or more vacation timeshare properties and become RCI members. RCI enables people who own vacation timeshares to exchange time at their resort property (or properties) for time at another RCI member property. RCI's extensive 3.8 million member network of timeshare properties is its primary asset and numbers over 85,000 properties spanning 4,500 resorts and 100 countries worldwide. RCI's members can either use their own timeshare(s) or exchange the use of their timeshare(s) for another. This exchange process usually involves properties whose values are frequently different and often changing and is therefore quite complex. RCI is a fiduciary and revenue is driven primarily by memberships and timeshare exchanges and rentals. RCI was founded in 1974 and is part of the Wyndham Worldwide group of companies.

RCI has historically relied on mainframe database technology for managing its inventory of member properties. The original member application for finding properties required members to define criteria that would generate a query against this database. However, the questions answered by members yielded criteria that often proved too specific. Result sets with zero matches were occurring 33% of the time, and result sets with five or fewer matches were occurring 57% of the time. Consequently, RCI needed a more effective way to make more member properties visible.

RCI quickly decided that a better approach to supporting exchanges was to show members "what RCI has" rather than "what the member wants." This would be accomplished by showing the entire inventory visually on a map of the world and allowing members to subset this inventory stepwise based on the many variables that described each property. RCI considered three approaches to reengineer this application: purchase a packaged application, rebuild its inventory using an object-oriented database management system (OODBMS) front ended by Java, or combine the use of search engine and decision management software. Because no packaged applications existed that were close to addressing its needs, RCI elected to build its own. The complexity of implementing an OODBMS combined with the application emphasis on conditional logic resulted in a decision to pursue a search engine and BRMS solution.

Searching for the right solution for its needs, RCI considered products from a variety of BRMS vendors. IBM, however, had a unique mix of capabilities, including a mature

BRMS product, professional services, and knowledge of the hospitality business. RCI experimented at first by building an application for its smaller rental market with the same design points as those for its much larger exchange market. This allowed RCI to test and gain feedback in a much more controlled and lower-risk setting. Customers were very impressed with the new application, which made it far easier for IT to sell the company on building the more complex exchange application.

The exchange application was built using a combination of search (Endeca Commerce Suite) and rule processing (ILOG JRules) technologies. Search was responsible for visualization and user interaction. Rule processing was primarily responsible for pricing. Because exchanges are guided by price, the pricing engine was essentially the most important and complex component of the application. Price is a function of 10–20 variables, and the pricing engine performs over 50 million pricing calculations per day, with most of these calculations being performed in real time by RCI's members and 700+ business partners. The pricing engine uses a combination of decision tables when sequential stepwise rule processing is required and inferencing when decisioning is ad hoc but must accommodate all predefined relationships.

Because the exchange application was mission critical to RCI and described as a "bet your business" application, prototyping was found to be critical. In the words of RCI, this allowed it to "fail faster" when making key decisions regarding how to architect the new application. Equally important was access to IBM's professional services team for support in troubleshooting and advice on building some of the more demanding aspects of the application, such as the integration between Endeca and JRules. RCI was clear on the importance of vendor-sponsored professional services, which factored heavily into its choice of IBM. The exchange application has been a huge success for RCI from both customer and economic perspectives. Customers and business partners now have a more intuitive, holistic, and comprehensive way to understand the benefits and costs associated with exchanges, and RCI has been able to offload 10,000 CPU hours per year from its mainframe onto "pizza boxes," which have far lower operational costs.

When RCI was queried on the best attributes of JRules, it responded, "...it just works." Once again, RCI pointed to the maturity of the product and the fact that the product gives the company very few problems. In fact, RCI stated that JRules gives it the least problems of all the products it is using. RCI also feels that JRules governance (change management features) is invaluable in keeping its products running smoothly. In instances where an analyst makes a change that is pushed to production and causes an unforeseen problem, RCI goes into JRules governance and can see who made the change and when. A discussion with the appropriate analyst can then take place and, if necessary, the rule set can be backed out and quickly restored to its prior state.

RCI experienced some challenges with JRules despite all of the positive attributes that it can cite. Originally, RCI faced challenges from a learning curve perspective. However, it built a staff and a center of excellence for the product, learned the product's nuances, and joined user groups. All of this helped build product expertise quickly and, along with support from ILOG professional services, enabled a relatively fast and smooth integration of JRules into the RCI technology stack. Rule Team Server was also a JRules component that benefited from a degree of customization. While the JRules Rule Team Server is designed to provide developers and business analysts with access to all rules, RCI customized its operation by role so that users would see only those rules and objects that

were pertinent to them. RCI also invested significant time in integrating the back-end JRules-based pricing component with the front-end Endeca-based enterprise search engine. This involved normalizing the interface between JRules and the search engine, Java objects, and database, which all performed filtering based on rule processing. RCI also found that the definition of the JRules business object model was critical so that the application would be more intuitive to end users.

The most important best practice that RCI recommended is to partner up front with all of the vendors involved to establish a strong base architecture that is compatible with the products being implemented. RCI believes that it might have failed had it not taken this step because of the importance of synchronizing multiple product architectures. Prototyping, as mentioned earlier, was a key technique in this process and allowed RCI to fail more quickly, at low risk, and implement changes early on in the life cycle to address the issues that were uncovered. Another best practice is to understand the overall enterprise architecture. The purpose of enterprise architecture is to understand the current state of the IT environment, identify a future state for this environment, and assess the impact and activities required to move to this future state over time. Part of establishing this enterprise architecture was the development of an object model that provided a clean separation of concerns and isolation between the core runtime components. This provided RCI with added insurance in the event that it needed to swap out one vendor's runtime engine for another. Finally, data validation was a key concern for RCI and required more effort than the company had anticipated, and it presents an opportunity to IBM as an area for improvement.

RCI's exchange application is a good fit for a BRMS because of the complex conditional logic required to determine the "price" of a property at a future point in time. RCI's experience echoes that of other similar case studies and is testimony to the importance of leveraging a BRMS that is mature, high performing, and equipped with an adequate governance model.

FUTURE OUTLOOK

The pressures driving BRMS adoption, which include performance, maturity, agility, and governance, will only intensify in the coming years. Organizations will become more reliant on IT, and their decisions and actions will need to be finer grained and better tailored to customer needs as well as occur in real time.

IT is changing in many additional ways that will bring BRMS more to the forefront of application development. Configuration-based development and more decision-centric application development are two indications of this transformation. Relational database engines, application servers, integration servers, business rules management systems, and business process management (BPM) systems are all examples of deployment technologies that help organizations build structured applications better, faster, and less expensively. Deployment technologies provide runtime services that can be readily configured to meet customer needs. When compared with bare metal coding, integrated deployment technologies generally provide an order of magnitude (10x) improvement in development efficiency.

Besides the transformation from coding to configuration that is occurring, agility is beginning to drive a shift from process-centric to decision-centric application development. Process-centric application development is focused around tasks, actions, and workflow and has been the common approach to application development since the 1960s. BPM is simply the latest configuration-based approach to process-centric application development. However, there is a growing recognition that actions should occur only as a result of decisions. Actions that occur without decisions are unintended or undesired. BRMS technology provides an effective way to identify what conditions should be linked to specific actions. This ability to associate conditions and actions is what decision technology does. Organizations that adopt a decision-centric approach to application development are finding that these applications are more responsive to change, have a high level of transparency in how they function, consume IT resources more efficiently, and can be modified more easily and much faster.

CONCLUSION

IDC research has consistently identified BRMS technology as one of the IT industry's higher-growth areas. Buyer-focused research confirms the value proposition that BRMS delivers. The popularity of BPM (in which BRMS acts in a supporting role) and the recent emphasis by all of the leading ISVs in delivering business rules technology confirm the significance of BRMS in the IT industry. Just as BRMS is providing business value today, the indications are that as the industry transforms to being configuration based, service oriented, event driven, and decision centric, BRMS technology is likely to play a far more important and core role in orchestrating IT activities.

LEARN MORE

Related Research

- ☒ For more information on IBM's BRMS products, see <http://ibm.com/brms>.
- ☒ *Worldwide Business Rules Management Systems 2011–2015 Forecast and 2010 Vendor Shares* (IDC #229182, July 2011)

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