

EXPANDING ACTIVE DECISION-MAKING: THE POWER OF INTEGRATING BUSINESS RULES AND EVENTS

With the JBoss Enterprise Business Rules Management System, build active decision-making into a wider range of applications while creating more agile, transparent business operations.

ABSTRACT

By easing the process of integrating business events into automated decision-making, JBoss® Enterprise Business Rules Management System (BRMS) is helping organizations incorporate real-time awareness in their applications and implement the high levels of automation needed for today's fast-paced business operations. With the many benefits of a budget-friendly open source software subscription, this powerful technology is more accessible than ever before.

Using JBoss Enterprise BRMS, business analysts, developers, and integrators can create and manage rules and events in a single product using a shared set of authoring tools. This synergistic approach streamlines implementation of active decision-making and enables more efficient and effective management of powerful decision logic. By separating business rules and events from application code, JBoss Enterprise BRMS reduces the complexity of the development process while enabling organizations to create more powerful applications. The result is a more agile, transparent, and competitive business.

If in the past you have not found business rules technology sufficiently compelling for your company or projects, now is the time to take another look.



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WANTED: MORE POWERFUL APPLICATIONS, EASIER DEVELOPMENT, GREATER TRANSPARENCY

To create more effective business operations while controlling costs, companies are dramatically increasing the level of automation in their business operations. Today's business applications are more dynamic than ever – more integrated, more interactive, with greater numbers of access points. And they make more decisions on their own, automatically. To do this, they need more context – more information about what is happening in real time, whether in user interactions, in other systems, or in the external environment. These interdependencies make it harder for organizations to implement sophisticated business operations that incorporate greater degrees of automation, yet are agile enough to respond to changing market conditions.

Complicating this challenge is the accelerating pace of business policy change. Consider the rapid shifts in mortgage lending or credit card policies in the wake of the recent financial crisis. If policies are embedded in lengthy and complex application code, the rules that execute those policies are understood only by the highly-trained and experienced software developers who implement that code. Even a seemingly simple change – altering the way credit card interest rates are determined – can require time-consuming and costly implementation that hinders the organization's ability to respond quickly to market shifts. By the same token, if the logic needed to process relevant real-time events from diverse sources is embedded in code, complexity can increase exponentially.

In addition, an increasingly stringent regulatory environment places further stress on development and maintenance. Not only must organizations implement more sophisticated and highly automated business operations, but they must also ensure that these business activities are transparent to business process owners, auditors, and others.

The bottom line: Growing sophistication in the behavior of applications must be countered by more powerful development approaches that simplify both the development process and the transparency of the resulting application – or businesses will not be able to compete and scale.

Multiple technologies have emerged to address these challenges, including business rules management systems. With a BRMS, organizations can maintain the logic that reflects business policy – the business rules – separate from other parts of the application. A BRMS can simplify and streamline application development and maintenance while rendering the execution of business activity much more transparent and auditable. The practice of isolating business rules and then managing and maintaining them independent of application code can enable organizations to:

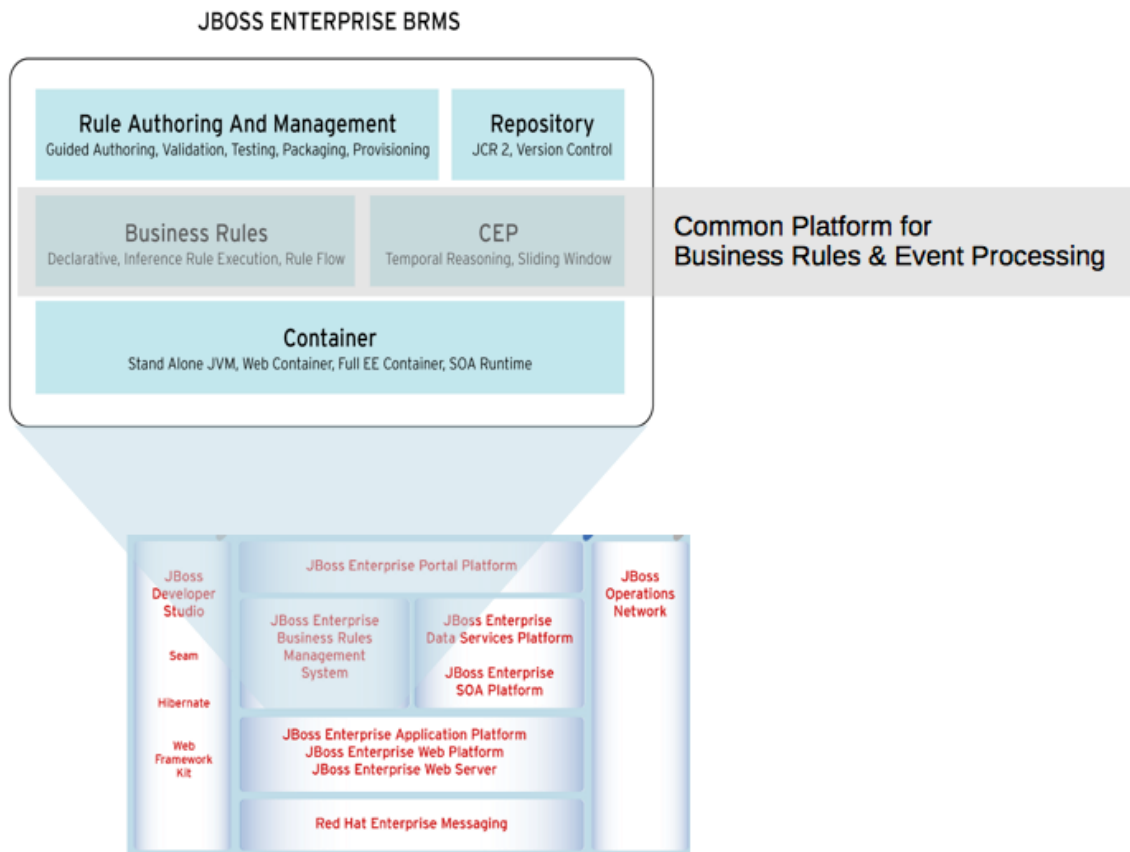
- More easily implement the sophisticated business logic demanded by today's applications
- Simplify the process of aligning automated systems with business strategy
- Significantly reduce development time
- Implement changes more quickly, without costly application recoding
- Store, retrieve, and reuse rules rather than continually re-create them
- Improve business consistency via a common rules foundation
- Foster more efficient collaboration among all the constituencies impacted by automation of business policies
- Improve the transparency of business operations and the rules driving them

NOW COMPELLING FOR A WIDER RANGE OF APPLICATIONS

Earlier generations of business rules systems often were cost-effective and compelling for only the largest organizations or those with the most complex business logic. If you round up the usual suspects of candidate applications for business rules technology, you will find mortgage origination, insurance underwriting, claims adjudication, fraud detection, government benefit eligibility and complex product configuration among the leading use cases. Those earlier rules systems were quite complex to implement, despite the claims of being business-user friendly. As a result, their use was limited to a narrow set of applications for which they offered such compelling value that the organizations implementing them were willing to accommodate the complexity.

JBoss is changing all this. Combining a rich set of features, including complex event processing, with the benefits of open source, including a budget-friendly subscription model and the input of a vibrant open source community, JBoss BRMS significantly expands the number of organizations that can take advantage of advanced business rules technology.

FIGURE 1





Expanding active decision-making:
The power of integrating business rules and events

For a variety of reasons, this change is timely:

- Where an application once had a small and manageable number of conditional statements that implemented the logic of a straightforward and simple business policy, today's applications often contain highly complex decision logic that represents a carefully designed set of policies.
- Many different points of entry (web; brick-and-mortar store; telephone; or a partner's web, store, or telephone) will create a different set of conditions for the same application and require a different logic path.
- The real-time decision-making requirements for applications are growing, with the result that they must recognize and respond to a range of events from many different sources.

As a result, the potential for unmanageable complexity explodes, posing challenges even for the most skilled and experienced developers.

Beyond the usual suspects, business rules technology now can be deployed effectively for any application that expresses policies governing how the enterprise does business. As the drive to automate continues, the set of applications for which business rules technology delivers compelling value will continue to expand.

SHORTENING CYCLES FOR BUSINESS ANALYSTS AND DEVELOPERS

Business rules management systems can make sophisticated decision logic much easier to implement and manage over time by transforming the rule authoring and maintenance process. When rule development is separate from overall application development, business process owners, business analysts, integrators, or developers can easily translate clear policies into executable business rules, using authoring tools with which they are familiar (such as Excel for decision tables, for example). They can then reuse those rules wherever the policy is relevant and modify them as needed to respond to changing business policy. At the same time, developers can create the presentation logic, integration glue, and infrastructure management their applications require, knowing they can simply invoke the right rules at the right time.

Despite the best planning, application development always includes some elements of a discovery process, and if business policies are being invented and refined during the application development process, isolating the rules that implement those policies will enable that development process to proceed much more efficiently.

For situations in which applications are changing rapidly, a BRMS can facilitate those changes by significantly reducing the labor and risk involved in maintenance. When analysts or developers can find and understand business rules more easily, they can change them more easily. This means that the time from deciding on a new policy to implementing that policy in systems can be shortened substantially, and depending on how your staff is organized, your most skilled developers might not need to be involved at all.

COMBINING EVENTS AND RULES: REAL-TIME AWARENESS FOR ACTIVE DECISION-MAKING

As mentioned earlier, more and more of today's business processes are event-driven, making it more important to be able to incorporate event-processing capabilities in applications. Business operations that are able to act on a larger number of relevant events can make more sophisticated decisions that more effectively implement business strategies, thereby improving the organization's ability to seize opportunities and minimize risk.

Human decision makers choose their actions based on as broad a range of information as possible. If an application is to make smarter decisions that implement more effective business strategies (effectively mimicking a human decision-maker), it too needs access to a range of information. And if developers are to build applications with more sophisticated decision-making capabilities, they need to provide a wider array of information to the application – often in real time. When applications can take action based on patterns they recognize in the information they are constantly receiving, the organization is able to implement decision-making applications that:

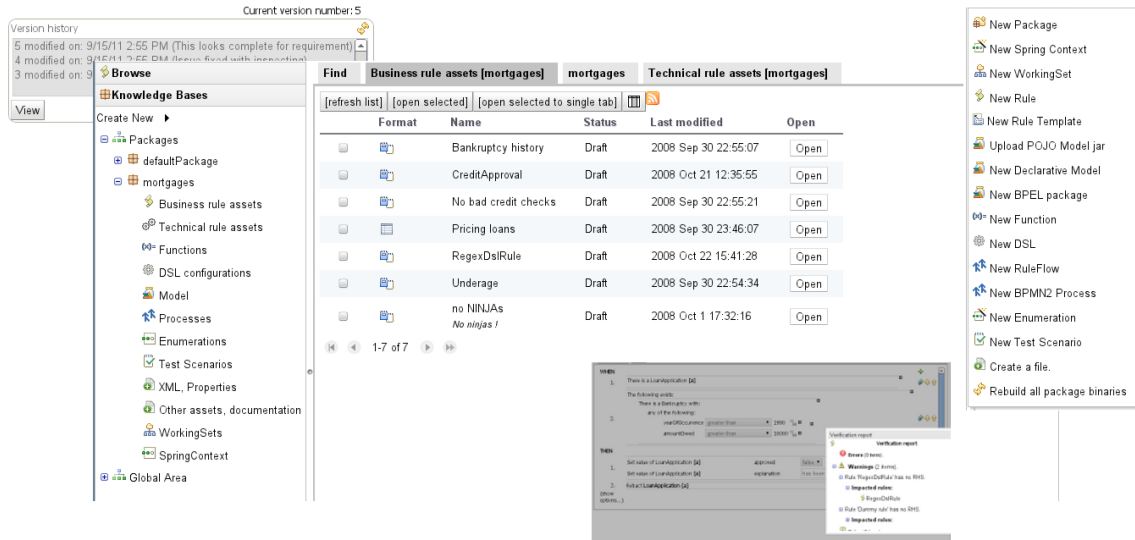
- Assess risk in order to price insurance or financial services
- Detect fraud or other criminal activity
- Track supplies, inventory, and other assets more precisely
- Personalize promotion details for different customer segments
- Tailor communications via mobile device based on a customer's physical location
- Optimize the utilization of maintenance personnel
- Deliver real-time information to customer service representatives who can then take advantage of a current interaction to up-sell or cross-sell to a customer
- Recognize, based on website activity, whether a prospect is likely to be really interested in a product or service

Information to make these decisions comes not only from transactional databases and from direct interactions with the application, but also from current context and from actions being taken by people and other systems. That context and those interactions give rise to specific events. For our purposes, an event is a significant, observable change of state at a particular point in time. Examples of events that are specific to a particular moment are:

- When package X is scanned at entry to warehouse Y
- When customer X contacts a service representative
- When the temperature in a meat locker exceeds the safe storage level
- When credit card X is used to purchase gasoline at location Y

By knowing that events have occurred – and when they occurred, either in absolute terms or in relation to other events – applications can make decisions that eliminate the need for human intervention – or guide the intervention in ways that make it more efficient or effective.

FIGURE 2



TEMPORAL LOGIC: THE IMPORTANCE OF “WHEN”

To have the capacity for active decision-making, a system must have greater awareness of its environment. That is, it must be able to sense changes as they occur, identify those changes that are relevant to a given business operation, and take appropriate action in response. This sensory apparatus is a key component of event-driven applications.

When business rules are aware of events, the rules can execute in response to these events. For example, if a customer telephones a call center, the response to that customer may be driven by business rules that guide offers based on customer profile demographics and past purchase history. These are likely to be known data sets available from customer and/or marketing databases that can populate a business rules application. But imagine a customer service scenario that enriches the interaction with awareness of how long the customer lingered at certain parts of the website (indicating interest in certain products) or how long he or she waited in a call queue before a service rep engaged with the customer. This deeper level of knowledge—based in part on temporal information—enables the system to initiate an application that provides information to the service representative about patterns in that customer’s recent interactions with the company, and perhaps offers suggestions for how to take advantage of that customer interaction.

DETERMINING BUSINESS-RELEVANT EVENTS

Simple events are typically low-level, granular data points that individually have little business significance. What is meaningful to the business application is a higher-level business event that is effectively a pattern of lower level events that, taken together, mean something relevant to the business. In order for the low-level events to be useful to an application, the system must be able to read and interpret them so it can identify business events relevant to the application. That is, it must be able to recognize the low-level events and patterns that make up a given business event.

That is the goal of complex event processing, a powerful new capability that allows the JBoss Enterprise BRMS to process multiple events with the goal of identifying the meaningful ones. This process involves:

- Detection of specific events
- Correlation of multiple discrete events based on causality, event attributes, and timing
- Abstraction into higher-level (i.e. complex or composite) events

It is this ability to detect, correlate and determine business relevance that powers a truly active decision-making capability.

As an example, consider the clinical treatment operations of a medical care facility. The nurses' station has monitors for each patient room, tied to various sensors that feed information on the patients' condition, as well as the state of the equipment that is attending to the patients. The signals are events that can inform rules that govern when a patient's situation has materially changed and warrants attention. The events are a non-stop, voluminous stream of information. Without the capability to detect, correlate and abstract, medical personnel would be overwhelmed with all the sensor information; it would effectively become noise. Sensory overload would prevent them from understanding which events were important. With complex event processing, the system can process the sensor data and recognize higher-level events relevant to the task at hand, so that only certain situations will trigger alarms.

For another example, consider a financial trader who wants to pursue certain trading opportunities. Evidence of such opportunities (business events) is found in a pattern of stock movements executing within a certain time period. A single stock price movement by itself might not signal the opportunity, but if a certain pattern is observed, then the opportunity exists. Of course, that trading opportunity might have to be viewed in a broader context, one that takes into account business rules governing risk exposure for a particular portfolio, the trader's authorization to trade at certain amounts, the client's policies, and a host of other rules. It is the combination of events and rules that enables more powerful rules that support the higher levels of automation today's business operations require.

CREATING AND MANAGING RULES AND EVENTS TOGETHER

Combining business events with business rules makes decision-making active. To ease the implementation of active decision-making for business analysts and developers, JBoss Enterprise BRMS brings events and rules together so that they can be defined using a common set of authoring tools. Where some vendors provide separate tools that specialize in events or specialize in rules, each with its own idiom and audience, JBoss has incorporated complex event processing (with temporal rules capability) within the BRMS itself.

The result is a process in which both rules and events can be defined and managed using syntax that is aware of the special characteristics of events. Just as we can gain power from segregating business rules from application code, so we can gain additional power from defining events outside application code and integrating them with rules. When we do this, business logic – the logic that expresses and prescribes business activity – is clearly defined in a repository managed by business analysts. Application developers can draw on this business logic as they create and integrate applications.



TAKE ANOTHER LOOK AT BUSINESS RULES

If the challenges described in this paper seem familiar, perhaps it's time to take another look at business rules management systems. With the availability of budget-friendly open source solutions, many small and medium-sized enterprises are discovering that they can take advantage of the power of a BRMS – and integrated complex event processing – to simplify development of powerful applications, shorten development cycles, ease maintenance, improve business transparency and compliance, and create a more agile business.

To learn more about the JBoss Enterprise Business Rules Management System (BRMS) and other Red Hat® resources to support your application development and integration goals, please contact your Red Hat representative or visit jboss.com/products/platforms/brms/supportedconfigurations/.

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