DECISIONS

WHITEPAPER

BUSINESS RULE BASICS

Understanding Business Rules and Automated Decisioning

What is a Business Rule and Why Are They Important?

WHAT IS A BUSINESS RULE?

All businesses have business rules as they provide the guidelines for how the business should operate. Rules can be thought of as declarative statements of fact - both simple and complex. Rules can produce outcomes ranging from a simple yes/no decision all the way to complex scoring based on multiple criteria.

Business rules live throughout the organization and often represent the collective experience of professionals that have contributed to the business. This retained knowledge or 'rules of thumb' help us quickly manage risks and capitalize on opportunities.

Variations of business rules are infinite but some common examples include:

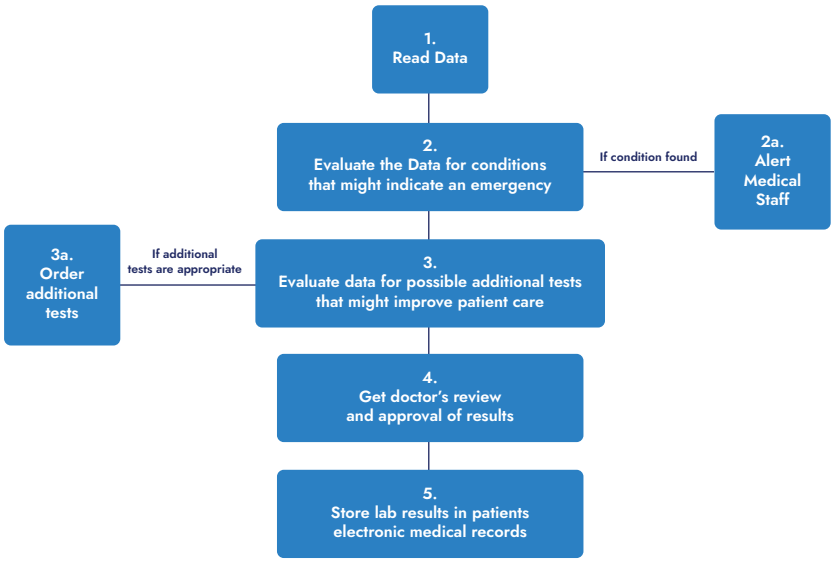
- Business rules that define which individuals must approve certain actions based on multiple variables. For example, the type of vendor, deal size or other variables, dictates who has to sign off on a contract.
- Business rules that manage transactions by defining what products to offer based on past behaviour, determining discounts based on transaction size, or calculating commissions
- Business rules that validate data or identify outliers that can trigger an audit or require human input.

Business Rules vs Workflows

Like business rules, workflow exists in every organization whether we know it or not. For our purposes we will define workflow as processing information through a series of steps with people interacting at some points to make decisions and software automating at others.

Rules are a critical part of any workflow because they are applied to data to make decisions within the workflow, even if that workflow is a manual human process.

Consider the example of processing medical lab results in a hospital. This "workflow" might have the following high-level steps:



The above scenario is a simple example of a process, or workflow. The second step is a decision point and could use rules. In this step a set of rules are applied to the data that might check the patient's white blood cell count against set parameters or against a median count for that age group. Another rule is applied at step three. Workflow and rules work together naturally where a rule helps make a decision about the path to proceed in a workflow.

In this workflow, professionals are also a key piece of the process. In step 4 a physician's vast knowledge and expertise is leveraged to ensure that business rules are doing what they are supposed to.

With business rules and workflows at the heart of any operation, properly managing and optimizing them make organizations more efficient.

HOW ORGANIZATIONS MANAGE BUSINESS RULES AND WORKFLOWS

Companies tend to manage business rules and workflows in a number of ways. Traditionally they might be documented in a guidebook or handbook. They may also be incorporated into a

variety of different software applications or they could just live in the heads of employees. These different approaches are not necessarily the best option to manage business rules. If they are locked in software code or documented in a manual, they are difficult to change and access. If they only live in the heads of your employees, these rules go out the door every day and could be impossible to access in the future.

Business rules engines can help solve this problem by aggregating rules on a single platform and making it easy for business leaders and analysts to make changes to capture and operationalize collective knowledge.

They can also be automated to increase efficiency. The importance of automating business rule and decision making in the age of digital transformation.

Digital transformation is the buzzword of the decade and its meaning is being coopeted to mean whatever you want but business rules and process automation are undoubtedly a core component. As the world produces more and more data, organizations have more resources to make better and more timely decisions. Transforming manual processes into digital ones enables organizations to leverage this data to better decisions quicker and incorporate them into work flows much more efficiently.

Automation can make things much more efficient but also more complex. The age of digital transformation leads to more nimble businesses and markets that move very quickly. Businesses need a firm understanding of how to leverage rules and workflows to manage this complexity and rapid change.

Modern rules / workflow engines are helping organizations optimize their digital transformation strategy by automating rules and workflows. There are many tools available but fundamental to getting the most out of a business process automation strategy is understanding the different tools and processes to build business rules and how they can be leveraged to optimize operations.

Understanding the Structure of Business Rules

The way that rules are built or modelled should mirror the way that the logic owners think about the problem.

As such, there are a variety of different ways that rules can be expressed and how rules engines can support different types of rules. Below is a list of rule types, although not comprehensive, it does represent a number of different views of how rules can be modeled.

All of these rule types do share the common behaviour of ‘what they produce’. Do they provide an answer (yes/no), provide some data (like a score or rate) or do they trigger an action or process?

Basic Rules

SENTENCE

This is the most basic form of a rule and is essentially a rule expressed as a simple sentence. Most rule engines support this, but many do it by forcing the business analysts to learn a form of structured english. While this method of typing syntactically correct text into a rules engine is effective, it turns business analysts into pseudo-software-developers.

DIAGRAM

A rule diagram that lays out the same elements that would be in a sentence style rule, but shows it in a graphical view. Given that diagram rules and sentence rules represent the same elements, modern rules engines allow a rule author to toggle back and forth between a diagram and sentence view.

TABLE (TRUTH TABLE/RULE TABLE)

A truth table differs from more simple rule forms in the fact that there is a set of conditions and results that are arranged in a matrix. Conditions are configured in columns and the rows represent the matching criteria and the result for this criteria if it is met. Table based rules have the added benefit of being able to have more than one resulting answer if desired.

These rules are often used to look up appropriate data or rates, to find actions that need to be taken or produce a set of further criteria that might be useful in determining the further processing in an application.

INTERSECTION

Creating rules at an intersection allows for two different axes of rules that meet at a given point. This convergence point is then able to configure an outcome value. An example would be determining commissions by deal size and tenyer of the sales person.

EXPRESSION/CALCULATION

Formalizing any mathematical calculations also is a representation of business logic. Certainly, things like rates may sometimes be applied using declarative rules, if a loan amount is below 5,000, the rate is 2.9% for example. But there are times that an ‘spreadsheet style’ math computation that might include multiple variables and data arrays is useful as well. These computations can be used like any other rule to provide data to an application or process

PROCEDURAL/FLOW BASED

There are some rules that cannot be expressed in a declarative fashion, but have multiple stages of processing. This is where using a ‘process engine’ to process data via a set of rules allows for much greater flexibility. Essentially flows made up of sub-rules can be embedded into larger flows aggregating into a complex rule. As simple rules evolve into more complex flows the ability to adjust rules at all levels is important to ensure these types of rules are as flexible as possible, a key to business agility.

COMPLEX RULES AND WORKFLOWS

Simple rules can solve easy problems but more complex rules are needed to automate more complicated end-to-end workflows. A number of techniques, concepts and tools can be leveraged to put rules into practice to support complex workflows.

RULE SETS

Individual business rules may often seem trivial when considered on their own. For example, consider a rule about the minimum period of gainful employment for an applicant to be approved for a loan. This is a simple comparison of numbers. However, in the context of a set of rules used to score a loan application it is just one piece, albeit a very important piece. The composition of a number of rules is called a 'Rule Set'.

A rule set is an organization of a number of rules that compiled together produce a much larger and more nuanced result.

For instance: Processing a mortgage application requires the evaluation of a number of rules that make up not only the decision as to whether to approve but also variables like terms and specific conditions. Gathering these rules into sets allows discreet rules to be combined to form a composite decision.

SCORING USING RULE ENGINES

Rule Sets that produce numerical values can be combined into scoring type results. Each rule in the ruleset can contribute to the overall value. A flow can combine/average/sum/weigh the results of each rule to produce an overall evaluation.

For instance: A college application can be scored with a rule engine with different rules producing a relative value based on the data contained in the admissions packet. Each of the results might be given a weight to determine the overall score for the application. This enables admissions to rank all the applicants and see which may not meet certain thresholds.

LEARNING/INTERCEPTOR RULES

Interceptor rules are rules that are running against a stream of data and can stop items in that stream that fail individual conditions as well as trigger corrective action on items matching other rules and criteria. Learn more about learning and interceptor rules - Decisions has published an eBook on Interceptor Rules.

RULES AND REPORTING

Complex processes require complex reporting. One of the challenges of reports and dashboards is providing context to the data represented in them. Statistics without context do not provide much value. To gain insight data needs to be compared with other related data. For instance, is signing 20 new contracts in a week good or bad? To answer this, the data needs to be compared to expectations and/or historical results.

Analytics combined with rules can provide significant insights but they can also be an important driver in the rulemaking process. Trends in datasets can be used spawn new rules so that action can be taken.

Implementing Business Rules - Why Use a Rules Engine?

As a rule is a declaration of logic/policy/calculation/decision, to be valuable, it needs to be run within some active context, like a website or application. Users will rarely interact directly with a rule engine because it lacks the interfaces.

Instead, applications can use a web service to call a rule engine to process one or a set of rules. Direct integration into a messaging architecture can also allow for distributed and resilient processing of rules.

WHY NOT JUST USE PROGRAMMING LANGUAGES TO ENCODE BUSINESS LOGIC?

Business rule engines produce logic. Programming languages also produce logic... so, why not use a programming language to encode your business rules? While programming languages might be the most customizable way to produce logic, rule engines have a degree of flexibility that may be more beneficial to the business in the long run.

> When rules are built in a rule engine, they become a 'formal artifact' that can be named, classified, evolved and searched.

When rules are separated from the structure of the system, they can be understood, discussed and evolved. Since software is often built in layers, with each layer implemented using different technologies, it's very common to have rules stored in multiple spots in the software stack. The same rule that is built in the rule engine to capture user feedback could also be in a stored procedure to run on a database, or in the middle-tier programming language. This makes it difficult to keep rules consistent as they evolve.

The real reason that business rule engines are often ideal is because it allows business people to build, control and understand rules. Building logic in programming languages requires programmers to build the logic. This implies that the programmers have to understand the details of the rules to the same level as the business experts and owners who craft the rules.

What Are The Features You Need For a Rules Engine

Building business rules is much like building software and logic and processes need to be organized and documented. When contemplating adopting a rules platform, decision makers should consider how accessible the platform is, its testing capabilities, and how extensible it is.

ACCESSIBILITY

Making business rules more accessible yet robust is the key to greater business agility. Business rules engines must be easy to use so a diverse set of users can build and deploy complex business rules and workflows. Four features are important to ensure greater accessibility, no code, multiple representation models, rules management and graphical workflow design.

NO CODE/NO SCRIPT/NO STRUCTURED LANGUAGE

The key aspect of a rule engine is that it must allow construction of rules by non programmers. An environment where a business person can assemble elements into a rule without writing code is a requirement. While there may be different interpretations to what no-code really means, a rule designer that provides a text area for a person to type in statements is really a programming environment, not a business user focused tool.

VARIETY OF REPRESENTATION MODELS

As discussed above, there are multiple ways to think about expressing a rule and a good rule engine will allow the construction of a rule in a manner that matches how a rule is understood rather than forcing it into a more constraining model.

GRAPHICAL WORKFLOW ENGINE

Tools that support graphical logic creation and can create entire workflows using graphical designers are key to rules engines. These tools increase the speed of development and enable multiple parties to collaborate around workflows. The ability to visualize workflows and rules also supports more complex business processes.

TESTING

Although developers creating applications using a modern rule engine may not be writing code, they still need to make sure the app works the way it is supposed to.

Modern rules engine should include, integrated testing, versioning, and unit testing.

INTEGRATED TESTING

Obviously knowing a rule is technically valid is a key element, but how do you ensure that the rule produces the desired results without having to utilize more technical tools.
The tester must be able to run rules with different values as inputs and evaluate each set of outputs. Visibility into the execution path is also important.

VERSIONING/HISTORY

It is not only important to know the current state of a rule, but also see all the different iterations as the rule has changed over time. Being able to view and also test rules at a specific point in time is important to understand how business logic has evolved.

UNIT TESTING

Rules engines should be capable of testing rules both manually and automatically. Automating rule testing ensures the rule is behaving as expected.

EXTENSIBILITY & INTEGRATIONS

Business rules are unique and live throughout your organization utilizlng data that flows across organizations.

Business rules engines must be flexible and expandable to integrate with different data flows and systems.

EXTENSIBILITY

In many cases new rules elements need to be added to business processes that are specific to business problems. While many rules can be constructed out of standard components, sometimes a rule element will require access to additional information, service or functionality that is not present in the existing ruleset. An SDK for developers to create new pieces is needed. For a smoother experience these components should operate like they came native with the rule engine.

API ACCESS

To get the most out of your rules they need to be accessible by other platforms and UI's. APIs enable processes, websites, and applications to access the rules. The ability for platforms to expose outputs from workflows as an API as well as import data from other systems is also vital.

Machine Learning (ML) and The Future of Business Rules

As users consider business rules engines it is also important to pay attention to where the industry is going to ensure that you don't get left behind. Innovators are leveraging ML models to help drive rule creation. Using historical and real-time data, data scientists are analyzing data sets to identify patterns that could lead to new rules that can optimize operations. The ability to operationalize machine learning models into complex rules will be important to stay competitive in the future. Rules engines must be sophisticated enough to remain effective as the industry evolves.

Is a Business Rules Engine Right For My Organization?

Everyone should be thinking about how digital transformation can help them be more competitive or simply stay in the game. There are a lot of options out there and business rules engines are not always the best path. For organizations that are debating whether a business rules engine is right for them they may consider some of thwe following questions:

1. Is there an advantage for your rules to be created/edited and tested by business analysts rather than programmers?
2. Is there a need to understand what combination of rules apply to a specific interaction or decision? For example, knowing that an insurance claim was denied because of rule a, b and c.
3. Do you need to know what rules are applied to a certain transaction at a specific point of time?
4. Do you want to be able to test rules outside of the context of the application to ensure the logic is right?
5. Is it important that non-programmers understand what the actual rules logic is, not what the logic was supposed to be?
6. Do your rules change on a consistent basis, or do they need to change rapidly?
7. Do you have checklists just like this one that are used to evaluate things in your organization?
8. Are there manual or automated processes and workflows in your organization that need 'thresholds' applied to them?
9. Do you have business rules locked in various silos or SaaS platforms?
10. Do you have manual processes that are difficult to scale or limit your ability to serve customers effectively?

DECISIONS™

Decisions is a leading provider of no-code, business process automation software, headquartered in Chesapeake, VA. Decisions technology is deployed as the basis of multiple commercial applications in healthcare, life sciences, finance, logistics, and operations software. It is used directly by companies on almost every continent, ranging from mid-size companies to many Fortune 500 corporations.
Contact us at decisions.com.