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Research

Operational Decision Management

Making better business decisions with flexible, automated business rules and events

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Executive Summary

Many of the latest initiatives in the IT world are focused around aligning IT resources more closely with business users and business needs. The more that IT can reduce the gap between the requirements of the business community and the fulfilment of these requirements, the greater the improvement in business performance. Companies become more agile and responsive to market changes and new opportunities; governance and risk can be managed more effectively through better business-oriented visibility of operational execution; and processes can be streamlined and automated to improve customer service and reduce costs. This report focuses on one such area that has seen great strides recently, that of improved decision-making.

Executives often complain about inaccurate and untimely decision-making. Decisions should be made automatically at the point in time they are needed, and with greater accuracy. Too often, decisions have to be made manually and are based on inadequate data, are inconsistent and are difficult to inspect and validate. On top of this, even when improvements to decisions can be identified it takes far too long to implement them. What is wanted is a way to deliver automated operational decisions based on formalized decision-making criteria that the business community can inspect, validate, improve and update easily and quickly. The days of reviewing monthly reports to decide on necessary actions are long gone; instead, dynamic agility is required to remain competitive and seize new opportunities. Two key technologies have emerged that are helping companies take great strides towards these objectives; Business Rules and Business Events.

Business Rules Management Systems (BRMSs) enable operational decisions to be taken automatically in real time by an embedded Business Rules Engine (BRE), based on documented rules that evaluate all the necessary information related to the decision and then come to the desired result. These rules therefore lay out the procedures currently in place that dictate how IT-based business operations are carried out, and the BRMS provides access to these rules in business terms so that the business community can author, edit, modify and inspect them as needed. Because these rules control operational execution, changing them will immediately modify decision-making, removing any need for IT application changes and the associated delays. Business agility is improved, costs are reduced and decision-making is streamlined. In addition, the visibility of the rules governing operational decision-making to business executives ensures that current procedures can be properly validated, resulting in more effective and efficient compliance management and greater decision accuracy.

BRMS technology opens up significant new opportunities for business success. For instance, the ability to automatically make different decisions in real time based on execution-specific information, such as the customer or client details and previous trading history, enables a higher degree of personalization and hence better business outcomes. But decision-making can also be extended through the use of business event processing (BEP) technology, which enables decision-making rules to take into account business performance and activities over time and across the wider enterprise. This really carries operational decision-making into a different dimension; now decisions can take into account not only execution-specific, point-in-time information but also trending information as well as information coming from other processes and applications across the enterprise. This extension opens up the way to more predictive operational decisions that can take into account business performance data across all aspects of business execution, but that are still actioned automatically without delay.

The rest of this report looks a little more deeply at the world of rules-based operational decision-making, showing how it can deliver better business outcomes through decisions that are automated and rigorous but at the same time flexible and open to inspection.

Introduction

Businesses in all industries and countries are facing increasingly complex, uncertain, volatile and competitive market conditions as globalisation, macro-economic conditions and new technologies combine to shake the marketplace to its foundations. In a recent survey of CEOs, the following reflects their views of changing conditions:

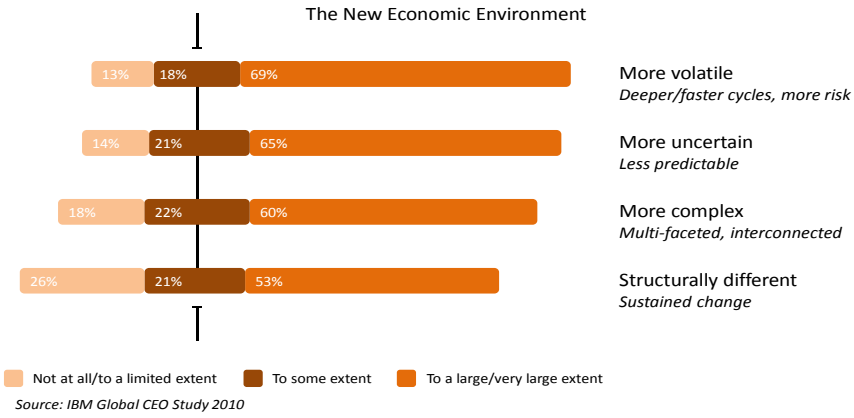

Figure 1: How CEOs view changing market conditions

These changing conditions lead to a number of important imperatives that are driving the strategy of many companies today. Most businesses, for example, attach great importance to focusing on the customer, in order to keep existing customers on board and hopefully attract new ones. Business agility is another clear aim, with the unpredictability, increased competition and structural changes driving a need to respond to change quickly and effectively. A particularly topical imperative given recent world events is that increasingly risky and uncertain conditions make controlling costs even more important than usual, to preserve profitability and increase company robustness. But overriding all of these is the need for effective governance and auditability, to ensure that the company is managing risk appropriately, controlling operational execution and adhering to regulatory and corporate policy.

- Focus on customer service: volatile and uncertain conditions together with increased globalization and competition place even greater emphasis on customer retention and the need to attract new business
- Business agility: The changing conditions depicted above lead to a need for business to respond to new opportunities quickly and effectively so that market share can be increased and profits can grow.
- Cost reduction: In times of uncertainty and risk, it is essential to keep costs down to ensure profitability and provide the financial robustness that can withstand major market changes.
- Governance: Change brings risk, and it is therefore vital that business outcomes are constantly validated, measured and audited to ensure accuracy, consistency and compliance with corporate and regulatory goals.

While the high-level processes that drive the business are usually reasonably well understood, it is the decision-making that controls how these transactions are executed in day-to-day business operations and hence offers the potential to create new value in operational execution. A simple example may help to set the scene for the subsequent discussion. It is not uncommon to find banks building a limit into their loan approval systems beyond which supervisory approval is required. The argument is that while the decision-making process required to approve or reject loans is usually pretty simple, making it easily handled by less experienced personnel, in more complex cases with larger loans there may be many additional factors to take into account; overall liquidity levels, exposure to a particular market sector or organization, a suspect credit rating, sensitive geographies and a host of other factors. Hence the need for an experienced supervisor to get involved. But

these people are expensive, and the complexity of the process may mean that each supervisor might take a different reading and make a different decision. By taking these complex decision-making algorithms and placing them in a set of business rules, decisions will always be consistent and can be made immediately rather than waiting, with no need to involve highly-paid staff. In addition, because the rules are clearly visible to the business community, they can be tuned and optimized based on operational performance, while at the same time validated for regulatory compliance.

But there is a problem. The information controlling decision-making is often spread throughout the enterprise in different forms. Decisions might involve using office documents and spread-sheets, talking to other people, running particular IT applications and following specific documented processes. The result is that decision-making can be a lengthy process that can come up with wildly different results depending on which sources of information are used and that is very difficult to validate and inspect. On top of this, with the increasing complexity and uncertainty reflected in the survey above combined with the interconnectedness of modern business, a common complaint from senior executives is that the quality of decision-making is poor. Often decisions are made on the wrong or inadequate information, and are not made in time to respond to customer or market needs. Visibility of the decision-making process is also poor, making it difficult to manage compliance and ensure that the company is operating in line with internal and external policies and regulations. Worse still, changing the decision-making to deliver different outcomes is a real challenge because there is no clear picture of how it is currently working, and therefore no way to determine what needs to change.

What is needed is a way to automate decision-making as far as possible to reduce costs and drive better customer service, while at the same time formalizing and recording the rules controlling the decision-making so that they can be inspected, validated and changed more easily to improve governance and deliver business agility. This is where business rules and events technology steps in. Using these technologies, companies can automate decision-making, controlling it through a set of business context rules that can be authored, viewed and edited by the business community. Changes made to these rules alter decision-making in live operations directly, without any involvement from IT, and the set of rules forms a clear and verifiable record of how business operations and decisions are being carried out.

Rules-based decision management

Having set the scene, the rules-based approach to operational decision management referred to above can be discussed in a little more detail. The cornerstone of the whole discussion is the concept of rules – documented descriptions of how business decisions are made during IT-based operational execution. The issue being addressed here is that the desired automation, agility and control required to respond to the needs of businesses today is inhibited because of the way the IT systems and working practices carrying out operational activities have been implemented. On the working practices side, there is immediate value in actually recording the decision-making process within IT applications that can then automate as much of the task as possible, greatly speeding up operations and enhancing customer service.

However, the IT side has problems of its own. Business owners have for many years come up with their requirements for operational business systems and then passed them to the IT department to translate into an implementation consisting of home-grown applications and purchased packages. These programs embody the desired processes and the decisions that control them, but not in any way that is externally visible to the business community. Often, decision information is actually spread across a number of different programs, with variable levels of documentation. When a business department needs to change the decision-making governing a particular process, the new requirement has to be submitted to the IT organization which then has to work out the places in the code where the decisions are embedded so they can be changed.

This may paint a slightly unfair picture, because some IT departments have done their very best to design well-architected applications that gather business logic for particular operations in one place, perhaps using such

techniques as SOA (service-oriented architecture) to achieve this. However, even with the best architectures, it is still almost impossible for the non-technical business community to inspect current decision-making rules, and although the architected approach does make change easier, it is still some way from truly agile.

Business Rules

The idea behind business rules is that instead of all the business logic being embedded in computer programs and thereby understandable and accessible only to programmers, the decision-making logic that controls the way each operational transaction is executed is made accessible to business users in the form of business rules that can be authored, reviewed and edited by the business community.

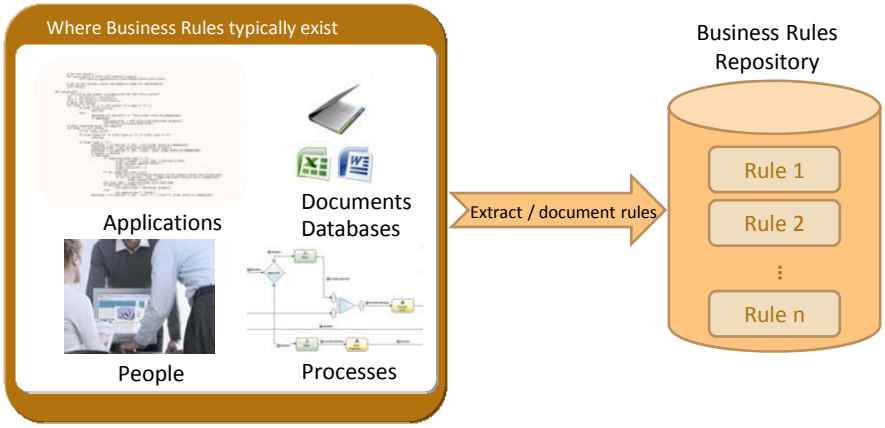

Figure 2: Business rules document the decision process from all sources

Deploying an updated business rule can be done in real time, immediately bringing about the desired changes. This brings an enormous amount of flexibility and agility to operations, enabling business users to respond to new initiatives, opportunities and threats more quickly and effectively. It also creates a rules repository that reflects the way business decisions are taken, and therefore provides an easily accessible 'system of record' for validation and compliance verification.

For example, take the process of opening a bank account; a reasonably straightforward process in high level terms. The business outcome of this operation can be automatically varied each time it is run, based on 'point in time' information, by putting in place the right rules to control the operational decision-making. Decisions taken when executing the process for a personal banking customer might include

- Is this a high net worth client? If so, allocate a Platinum account with added benefits
- Is the client a student? If so, offer a free financial health-check
- Is this a brand new client? If so, and today's date lies in our 'special offer' period we have been advertising, set interest at +2% for 6 months

This is a trivial example, of course, but it illustrates clearly how decision management can change the business outcome and enable companies to address new business needs quickly. The last decision might have been added because a competitor had decided to offer a bonus deal, and this is the response. It would be just as easy to decide to make the bonus rate +3% instead, demonstrating the agility of this approach, and it should be noted that these changes do not require changes to the application programs at all. But also, a business owner could easily check what the rule says at any point to make sure it is what was intended and that it does not fall foul of any regulatory or corporate policy requirements.

In IT terms, the way this functionality is delivered is through the use of a Business Rules Management System (BRMS). BRMSs will be discussed in more detail later.

Business Events

Business events are closely related to business rules. The difference between business events and business rules is that while the business rules are triggered at a point in time as part of a specific execution instance of a transaction, as discussed in the previous example, business events involve decision-making based on other dimensions, such as over time or correlated across other activities. There are actually two parts to events processing; detecting the event, and making the appropriate decisions based on that event occurring. The detection is not related solely to the point in time execution of a transaction, but instead to whatever else is happening in the business. Once all the preconditions for the event are met, the second step is to take action, either through a business rule or some other activity such as raising an alert to a supervisor. Events extend decision management so that decisions can be made not just based on a particular point in time transaction, but also on business situations that are a correlation of operational execution over time and across different systems.

A simple events example might be a retail company that has decided to introduce a new line with a limited offer discount, where the first 10,000 customers across all its stores will receive a 20% reduction in price. A business rule would set a discount level of 20% for this item, but also an event would be defined to trigger when the first 10,000 sales have been made. When triggered, the event would change the discount rule to stop discounting this item. But if the business decides that this promotion is bringing in a lot of new customers and it wants to keep the promotion going, this can be done easily by changing the decision in the event specification.

As in the business rules case, the objectives of agility and governance cannot be achieved unless both the definition of the business circumstances that make up the event and the corresponding decision-based actions are accessible and visible to the business community. Business Event Processing (BEP) performs equivalent functions to BRMS, providing a business-user interface for authoring, editing and viewing both the event conditions and the related actions (or rules), and the technical support to detect the defined event during operations and trigger the specified actions.

So business rules and events provide a way of extracting operational decision-making out of the IT applications and placing it firmly in the hands of the business community.

The role of Business Process Management

While considering the whole area of decision management based around business rules and events, it is worth positioning a related technology, Business Process Management (BPM), within the topic. As has already been discussed, a major driver for improved operational decision management is the desire to be able to author, edit and validate the decision-making rules that control IT-based business process execution within a business context, and without the need to involve any programming or other IT involvement. These decision-making rules are then either invoked synchronously within each execution instance of the process, or are triggered by event technology that enables them to be driven asynchronously when a set of circumstances occur. However it is important to understand that operational decision making can be used within any IT activity, not just those governed by BPM-specified processes.

BPM is all about providing a business-context model in the form of a process flowchart and driving execution based on this model. The goals of BPM are similar to those of rules-based decision management; give control to the business community, make change easier and faster and provide greater visibility and business alignment for IT operations. In fact, BPM makes an ideal consumer for business rules and events. The BPM model describes the components that are linked together to execute the desired process in flowchart fashion, but at various points in the flow it will of course need to have decision points that determine the next step in the flow. While these could be built into the BPM model definition, this would result in business decisions being embedded inside individual process models. The result would be that there would no longer be a single repository for key decision-making rules that can be browsed and validated; in order to understand the

decisions controlling operations it would be necessary to inspect each process flow and see what decisions have been embedded there.

However, if a BRMS is being used, then the BPM process flow can simply invoke the appropriate rule whenever it comes to a decision point in the process flow. Most modern BRMS products have the ability to take a rule or rule-set and convert it into a callable web service that can now be invoked during execution of the BPM process. Now all operational rules can be kept together, providing a much more complete record of what decision-making rules are in place and enabling them to be inspected and changed more easily. The same is true of business events; while BPM tools enable events to be created to alter process flows if certain situations occur, by using a BEP tool all the business events affecting decision-making can be gathered together in one place. In fact, isolating the decision-making rules from the processes provides other important advantages. Decision-making rules are likely to change much more often than process definitions, and therefore separating them avoids unnecessary churn, and in addition once separated the rules become available for use by other processes and applications.

What IT technology is required?

Business Rules Management System (BRMS)

The main IT technology that enables rules-based decision management is the Business Rules Management System (BRMS). While this paper does not intend to provide an in-depth analysis of decision-management technology, a high-level view of a BRMS is useful in terms of clarifying the concept. Recapping on the previous section, business rules document the decision-making processes in use by people and applications across the enterprise in the form of rules, stored in a business rules repository. The BRMS provides the tools to access this repository to make changes or view what is there, and to manage the execution of the rules as and when required during everyday business operations. Because rules tend to be quite granular, for ease of use they are usually gathered together in rule-sets that are aligned with particular operational activities. The BRMS run-time rules execution engine is often described as a Business Rules Engine (BRE).

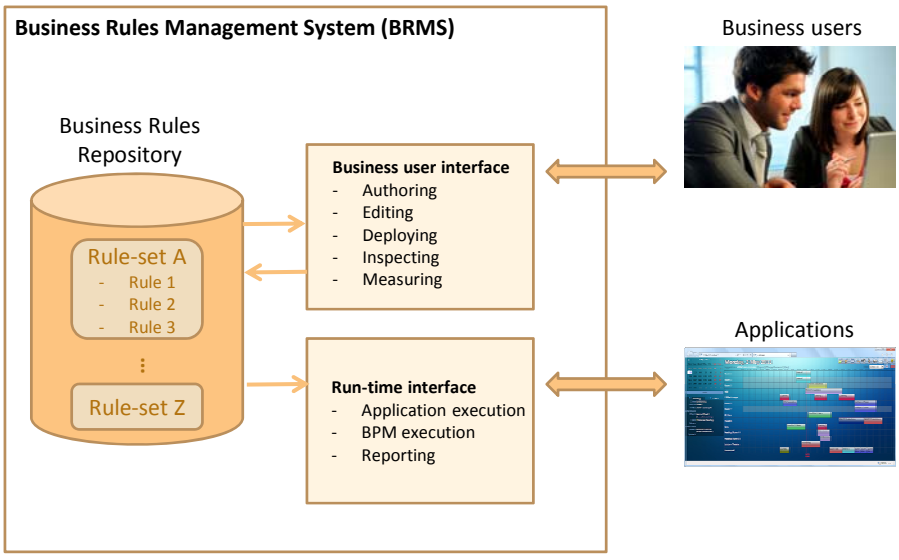

Figure 3: Business Rules Management System (BRMS) functionality

A critical feature of the BRMS is the business user interface. As mentioned before, in order to achieve the agility and visibility, this interface must feel comfortable to the business specialist and be non-technical in IT terms. The business rules themselves should be as near to plain language as possible, so that it is clear to business

analysts and owners exactly how the decisions are determined, and on what basis. Suppose a bank wants to increase competitiveness and customer retention by offering valued customers a better rate on car purchase loans. In order to reduce risk, the promotion is only for purchases of $20K or less, but for customers with a good history of financial management then the bank is prepared to offer a discount of 40 base points on the quoted interest rate. A business user viewing the current promotion decision might see a rule as follows:

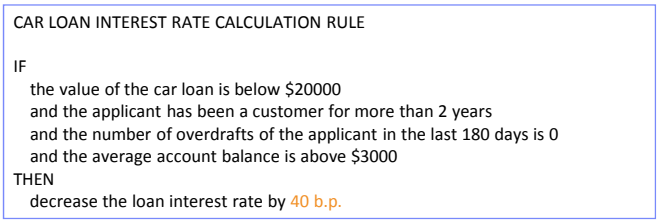

Figure 4: A typical 'business user' view of a decision-making rule presented by the BRMS

As well as providing the ability to author, update and inspect the rules, business users may well also want to measure how the rules are working. For example, an executive might want to know how often a loan approval decision is dropping through to a requirement for supervisory approval; if this rate is too high, loan approval processing will be impacted. The response might be either to relax the conditions under which supervisor intervention is required, or to put in place additional supervisory resources to handle the increased demands.

Business Event Processing (BEP)

Extending decision management to encompass decisions made on a wider basis, business event processing handles the specification and detection of business events of interest. As with BRMSs, the intent of this paper is not to try to provide an in-depth analysis of business event processors (BEPs), but at least at a high level it is beneficial to understand what makes up a BEP since it helps in the overall understanding of decision management options. As discussed earlier, the role of the BEP is to enable business-skilled users to specify operational circumstances of interest and corresponding decisions to be executed if such circumstances occur, and to then detect such circumstances and drive the associated actions. These circumstances could involve different systems, applications and transactions. The way the BEP achieves this is it gathers together information from many different sources and puts them into the proper business context. It then filters out any that are not relevant, only triggering the associated actions if a match is found.

There is a common confusion that needs clarifying here. Complex Event Processing (CEP) is to BEP what BREs are to BRMS; it is that subset of BEP that handles multiple data feeds, filtering and correlating them at a technical level as required. BEP utilizes the power of CEP technology, but it then adds a much-needed business context so that the business-authored circumstances of interest can be detected. Because business events are described by non-technical people in business terms, this translation is essential to make sense of all the technical data being received.

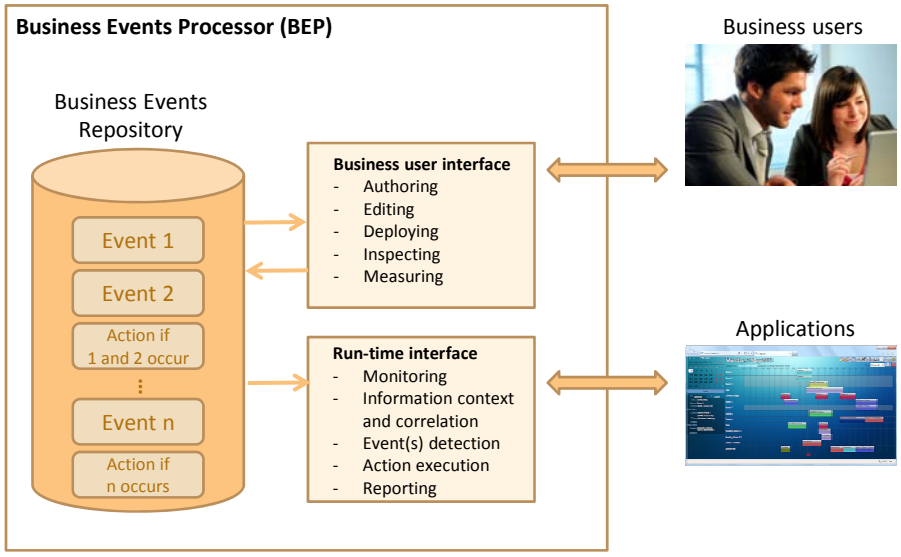

Figure 5: Business Events Processor functionality

The events specification is in business language, in a very similar fashion to that for Rules specification illustrated in figure 4 above. Actions may well involve changing or executing business rules that are managed by a BRMS. In this way, all the automated decision-making processes can be gathered together in one place, as a callable decision service.

Rules-based decision-making benefits

The preceding sections have referred throughout to some of the benefits of using business rules and events to improve operational decision-making and management. This section brings all of these points together as part of an overall summary of the benefits achievable with rules and events-based decision making. To do so, benefits will be grouped under the four key areas of pressure identified at the beginning of this document; customer focus, business agility, cost reduction and governance. This will position rules-based operational decision making against some of the major market imperatives today. In addition to these four reactive pressures, one further benefit area will be considered that is more proactive than reactive; smarter business operations.

Customer focus

The automation achievable through the application of business rules to handle decision-making also improves customer service. Processes that might have taken hours or days can now be handled within minutes, as decisions are made instantly rather than requiring human involvement and other delays. Removing the abstraction layer between rule definitions by the business community and rule implementation also ensures that decisions are more accurate and repeatable, again enhancing customer service. But a very important angle made possible through the use of rules to handle decision-making is that of personalizing process execution for the particular customer. With automated business rules in place, it becomes possible to build point-in-time rules that can change decisions based on the individual customer for whom the transaction is being executed. This enables companies to be much more focused in their response to individuals, opening up new opportunities while at the same time ensuring a very personalized level of customer service. This will be discussed further in the section on smarter operations.

Business agility

Automated decision-making pulls the process of making decisions out of the various different places it currently resides and combines it into a set of rules. This immediately has the effect of speeding up the process of changing decision-making, because now instead of having to go and find all the different documents, people and systems that implement parts of the decision-making procedure, the business analyst can just focus on the documented rule-set. On top of this, as referred to frequently throughout this analysis, the BRMS provides direct authoring and editing facilities to the business user, bypassing the need to get IT involved in rule changes and ensuring that the applications themselves remain untouched. Both of these features combine to make rules-based decision-making a route to a much greater degree of business agility, particularly for processes that are decision-heavy.

Cost reduction

The most powerful source of cost reduction by far is automation. By automating operational decisions through the use of rules wherever possible, instead of relying on employees to talk to the right people, refer to the right documents and choose the right applications to run, straight-through processing can be dramatically improved. Where possible, human interaction can be replaced by pre-defined decisions, not only reducing the demands on people's time, but also reducing training and education needs. The result is much more efficient use of resources and reduced overall costs. Beyond this, using business rules makes change less costly too, since rules can now be modified without requiring any changes to IT applications.

Governance

There are many aspects of a rules-based approach to decision-making that benefit the overall area of governance. The first is that adopting business rules is a way of formalizing the decision-making processes used to control operations. The improved automation combined with the fact that the decision-making rules are written down in one place and easily accessible combine to mean that operations become much more repeatable, predictable and auditable; decisions are not taken based on the skills of the particular individuals involved in executing a business transaction, but instead on a formal set of rules. This formalization reduces risk and also opens the door to a continuous auditing process. Because the formalization is based on rules that are business oriented, business owners can inspect the rules in use on a regular basis to ensure that decisions are being taken accurately and as intended, deliver the best possible business outcomes and that the decision-making process as a whole adheres to all relevant regulations and policies.

One aspect of the business context visibility of operational decision-making delivered by rules-based decisions is the opportunity for collaboration. With easy-to-use authoring, browsing and editing tools comes the opportunity for the business community to work together to ensure decision-making procedures are correct. Bringing together business experts across disciplines ensures that decision-making is not just optimized for particular parts of the business but across the business as a whole. The result is optimal decision-making that is accurate both in a specific and a general business context.

The other area that has a major bearing on better governance is that that of measurement and tracking. With a clear visibility of the rules governing the decisions that control business operations, it now becomes possible to monitor the outcomes of those decisions and analyse them. To repeat an example used earlier, if a decision on approving a loan is asking for supervisor approval too often, then this could indicate that the decision is not optimal in terms of efficient execution or perhaps that more supervisor resources are needed.

Smarter business operations

The final benefit area considered is concerned not so much with existing ways of doing business but rather with looking for new approaches to transform the business and drive it forwards. Business rules and events offer some great opportunities to support business transformation, helping companies to be more competitive and to address new challenges. For instance, if the critical decision-making procedures controlling operations are now

documented, and can be monitored, it becomes possible to build an accurate picture over time of the outcomes they generate and how effective they are. Combining rules and events to get a multi-dimensional view of operational decisions placed in their historical and systems-wide perspective may lead to greater understanding and corresponding improvements in decision-making. The feedback from monitoring these factors is valuable input in a continuous improvement loop, but it may also allow more complex and complete operational decisions to be taken. If certain patterns of system activity end up delivering sub-optimal outcomes, then these can be analysed by business specialists to see if changes are needed. For instance, in a banking environment it may be that patterns of decisions can be identified as the precursor to fraud, in which case the decisions can be changed accordingly to take the new information into account.

The other area with potential to offer smarter business opportunities is that of personalization. Because automated decision-making has the power to 'instantly' sample all sorts of different data sources as part of an execution instance on behalf of a particular customer, it becomes possible to tune the decision-making to deliver the best possible results for that customer and the business. This might cover what previous business interactions have taken place recently with the person, whether there have been any major changes of circumstance, what previous buying patterns this person has exhibited and many other factors. While it may well have been impossible or completely impractical to take these sorts of data points into account when decisions were being taken manually by a customer services representative, when the decisions are taking automatically this is not only possible but relatively easy. The benefit in terms of improved customer service can be stark.

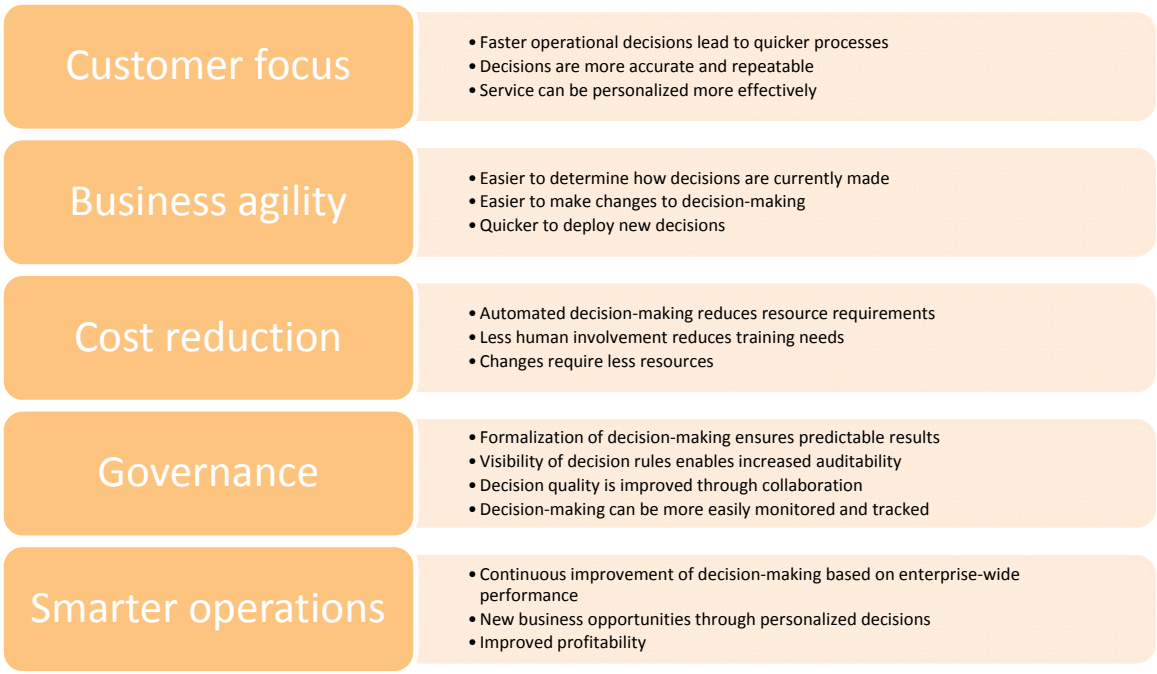

Figure 6: Summary of the major benefits of a rules-based approach to operational decision-making

Business rules and events in action

Having given a flavour of the way a rules-based approach to decisions aids better business outcomes and yields benefits in the above areas, this final section looks a little more deeply at specific examples where rules and events deliver value. For the purposes of this closer look, the Banking industry has been selected, but it could just as easily have been the Healthcare industry, Retail, Insurance or a host of other industry verticals. For consistency, this section will follow the five categories discussed in the previous section.

Rules-based decisions in banking – Customer focus

Customer care is an intensely sensitive subject for banks today. It has long been known in the banking industry that customer acquisition is vastly more expensive than customer retention, and therefore there has always been a focus on keeping customer satisfaction at an acceptable level. However the recent global economic meltdown has caused consumer opinion on banks to hit an all-time low. As a result, banks are struggling not just to keep customers but also to re-establish trust with them.

The customer care issue for banks has grown ever more complicated, however. With the emergence of new channels for banking services such as mobile and internet banking, and the broadening of services offered by banks to consumers in areas like insurance, equity trading and a highly competitive savings and loans market, getting a 360 view of the customer is imperative in order to maintain customer satisfaction. Rules-based decision management can help here, by offering highly personalized decision-making that takes into account information across many different customer touch points in real time.

As an example, many banks offer special accounts with attractive interest rates for client savings, but often these special rates are for a limited period. Consumers can get upset if they discover that they have passed the end of the bonus period and the rate is now minimal. Most banks allow the customer to simply open another 'special rate' account and move the funds to get an additional bonus period. Using a rules-based approach, whenever a customer interacts with the bank regarding this account, either in branch, over the phone or on the internet, a rule could check to see if the bonus interest rate has expired, and if so the customer can be informed of what to do to move the funds to the new account with the new bonus rate. This would have an immediate positive effect on that customer's satisfaction.

When customers get confused, they get upset, and one thing that confuses them is when the same request yields different answers. If a customer rings up to get a quote for car insurance, and then rings back to check, if the quote is not the same then the customer will not be impressed. By formalizing the decisions in the form of fixed rules, this should not happen. The formal approach brings repeatability and predictable outcomes.

At the corporate banking level, corporate clients often have specific requirements in terms of reporting on activities across all their accounts, such as getting updates sent when specified activity levels or credit limits are crossed. Once again, this is ideally managed by rules-based decision making, although in this case the solution may well involve both rules and events. Rules can be put in place to check for a specific activity and then trigger the desired reports, while an event can be defined take an aggregated view of activities involving this client and if an overall limit is crossed then trigger the rule that results in the reports being issued.

Rules-based decisions in banking – Business agility

Much has been said about the agility delivered by operational decisions supported by a Business Rules Management System (BRMS). To recap, the agility comes from the fact that business specialists can change the decisions directly, rather than having to wait for IT to make application changes. Naturally it is still essential that the necessary tools are in place to keep system change under control, but within this context it should be obvious that this direct, business-authored change capability delivers higher levels of business agility across banking operations. A few examples may help to reinforce this point.

Take the area of special offers. These may be part of an overall strategy, or could be in response to the actions of competitors. For instance, retail banks are always interested in trying to attract students, for a number of reasons. These young people will be the wage-earners of tomorrow, and today they tend to be short of money and therefore need credit services, so on these characteristics alone they are interesting. It is also easier to acquire a customer who has not yet established a relationship with another bank. Special offers might include free banking, short-term discounted rates on overdrafts and a range of other offers. By utilizing rules to manage these decisions, based on the criteria of whether the operation is on behalf of a student or not, the bank is now in a position to alter the offers at a moment's notice. So for example, if the offer involves free banking for 12

months, and a competitor makes a similar offer for 24 months, all that has to be done is to change the rule covering bank charges to specify that if the customer is a student, make the free period 24 months. No applications needed to change. What could have taken a few weeks can now be done in a few minutes.

In the area of corporate banking, the need for agility is also apparent. Interest rates, counterparty risk, liquidity management and foreign exchange movements are just some examples that will affect the decisions being taken in banking operations, and the ability to quickly change the criteria for operational decisions is extremely valuable, potentially saving money, increasing profitability and reducing risk.

Agility is also helped in another way. For more complex decisions, for example in the area of trading derivatives, it may be that the business specialist will need to do some research and take advice before being able to come up with the new recommendations. The BRMS-supported rules-based decisions approach provides the ability for pooling expert knowledge, in this case in derivatives trading, to quickly come up with the optimal approach to decision-making.

Rules-based decisions in banking – Cost reduction

The largest savings in cost come from the ability to automate operational decision-making rather than have to rely on personnel to make the right decisions based on a selection of inputs from other employees, documentation and personal experience. The cost of change is reduced also, because the decision-making procedures embedded in the rules and events can be changed more quickly and easily, with no need to alter applications. However the examples focus more on the benefits from automation.

A number of consumer-based banking services can be automated and offered on a self-service basis to customers through internet banking. For example, most internet banking services offer the ability to open an account, request a quote for a loan and even ask for an insurance quote for a car or other purchase. By putting all the required decision-making into rules, these services can be offered without requiring bank personnel to be involved, with the risk being mitigated by the personalization aspects of the rules. A customer requesting a quote for a loan who has a bad record at the bank for making payments on time might be charged a higher rate, for instance.

Payment authorization is another area where savings can be made. Instead of bank personnel needing to be employed to authorize payments in order to manage risk and liquidity appropriately, these decisions can be turned into algorithmic rules that can take payment authorization decisions automatically. Not only does this reduce costs, but it ensures repeatable and accurate decisions. Similarly, the settlement step can also be automated with rules to handle the complexities introduced by multi-currency, multi-bank, multi-country settlements.

These are simple examples, but there is little point in producing any more, since automating decision-making will reduce costs across just about any banking operation, freeing staff up from mechanical but time-consuming activities to deliver value in more productive ways.

Rules-based decisions in banking – Governance

A major area where the automated use of formalized business rules and events to control decisions can help is that of managing risk. For instance, in the area of financial risk, a topical area in recent years is that of the rogue trader. These rule-breakers can expose banks to huge losses through overly risky activities, but this can be controlled by ensuring that some level of their decision-making as they make their trades is embodied in clear and easily updatable business rules and events. These could set and police limits and help prevent the trader from becoming unacceptably exposed.

A similar approach can be used to address such areas as liquidity and credit counter-party risk. The more complicated the combination of data sources required to be correlated, the more beneficial an automated decision-making solution will be. Take transactional, or short-term, liquidity risk; that is, the risk of the bank

being unable to meet its payment obligations when they fall due. Gathering internal liquidity positions from branches and subsidiaries in weekly reports is just not going to be sufficient in today's ultra-conservative environment. Instead, near real-time assessments are what is needed, and this is exactly where automated decisions based on rules and events can help. By consolidating and correlating all of the factors from each branch that affect liquidity on an intra-day basis, decisions can be changed if acceptable limits are being reached.

Financial crimes detection and avoidance is another area that is a perfect match, using formalized business rules and events to control decisions. A lot of crimes detection is based around patterns of activity. Large amounts of money being taken from one account and switched to another, and then another, might signal money laundering or check kiting. A pattern of credit card activity that is out of the ordinary for the card holder could be a sign that the card has been stolen. Obviously these examples are highly simplistic, with the real fraud and crime situations being far more complex, but in essence pattern-matching is a major part of detection, or even prevention. Business rules and events can be defined to represent these patterns in terms of activities and data sources. The event processing correlation engine can continually search for a match with the specified occurrences and trigger the required rules if a problem is detected. However, financial crime is an area where the criminal community continues to become ever more inventive, and it will be essential to allow new events and rules to be written and modified constantly by the business experts so that the bank can keep up. Fortunately, the speed of change for these rules and events meets this demand.

Other governance benefits flow from the formalization and automation of decision-making, the visibility of current decision-making procedures, the agility to change these decisions quickly and the ability to track and measure the decisions and their outcomes more effectively. Consider the area of loans handling. In most countries, there are regulations governing the provision of loans, ensuring that loan offers are not made until the consumer has been provided with a range of different pieces of documentation. With the advent of multi-channel banking, some of this may have been provided at the branch, some through the internet and some via the consumer's mobile. A rule can be created that ensures the offer is not made until all the various pieces of documentation have been provided and signatures obtained, no matter which channels are involved. This ensures compliance with regulations.

Similarly, certain regulations such as SEPA demand that consumers using the bank for securities trading services should be presented with specific documentation for each trade, together with regular account updates. In this case, rules can be combined with events to ensure that all requirements are met. This ensures the bank is looking after its customers properly as well as adhering to the required regulations. In fact, whether it is Basel I/II/III, SEPA, Sarbannes-Oxley or the European Payment Services Directive, the rules-based approach provides an ideal basis for ensuring operational execution matches regulatory changes quickly, accurately and effectively.

Rules-based decisions in banking – Smarter operations

By using business rules and events to support operational decision-making, the bank can bring a much wider range of information to play in each decision. This is because the rules are executed automatically and are therefore faster than asking a person to gather data, and also because the events support enables multiple information sources to be correlated and filtered in near real-time. This added information enables banks to look at smarter ways to operate which would not have been possible before.

For example, a customer applying for a loan to purchase a new boat could be a good candidate for a boat insurance package too. A customer suddenly moving out of the markets in his or her personal trading account might be open to some lower-risk types of investment products. In each of these cases, the smart bank will use automated rules and events to help it get to the opportunity before the customer has a chance to consider competitive options. These opportunities for cross-selling and up-selling based on decisions taken that 'join the dots' between customer interactions offer a valuable source of additional business and share of wallet.

Of particular importance to retail banks is detecting the signs of a disgruntled customer early. Once a customer switches accounts to another bank then it is much harder to get them back. By using automated rules and events, aggregated across all the different channels and products, at any customer touch-point the bank gets a clear picture of customer activity history. If this activity is starting to drop well below the norm for that customer over a reasonable period of time, this may be a sign that the customer is starting to consider or even use other, competitive options. This could trigger a 'customer relationship' meeting with the branch manager to be scheduled, where any dissatisfaction can be addressed.

The other main area of smart banking enabled by the use of rules-based operational decision making is that of continual improvement. By formalizing decisions, specifying them clearly and making them easy to measure, it becomes possible to carry out a regular and detailed analysis of business outcomes related to the decision-making procedures currently in place. This feedback loop provides exactly the sort of input business analysts need to continually optimize decisions until the business outcomes are world class, improving profitability and stakeholder return.

Summary

In order to achieve better operational business decisions in a flexible and automated way, IT systems must provide business users with non-technical access to the decision points that affect the business and the ability to easily and quickly modify these rules and actions based on changing business conditions. Business rules management systems and their associated tooling make it possible to control the decision-making of individual business transactions as they execute through the use of rules that are authored and edited by the business community. These rules formalize and automate 'point-in-time' decisions to ensure predictable and repeatable results, while the added use of business events extends this operational decision management into new dimensions, enabling decisions that are based not just on the individual transaction being executed, but also on overall business performance across the enterprise in both real-time and historical contexts.

The result is faster business operations with reduced costs, increased customer service levels and a greater degree of operational visibility that enables more effective compliance management and closer alignment of IT to business objectives. Automated operational decision management makes the ideal platform for transforming into a smarter, more competitive and more efficient business that delivers increased value to stakeholders and a more profitable bottom line.

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