Business Rules Management: New Business Tool for Innovation and Accountability

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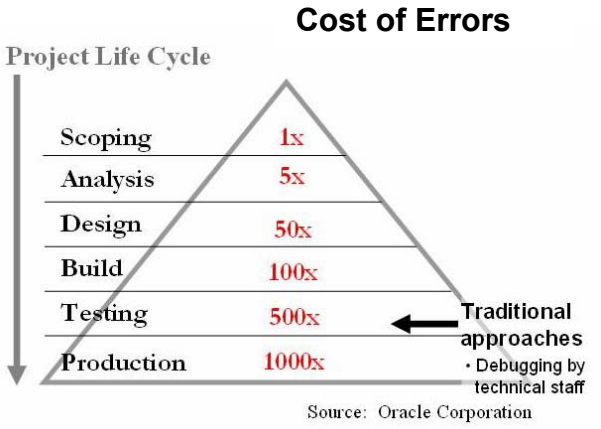
Progressive Insurance, Dell, Toyota and Wal-Mart are famous examples of companies that have achieved growth and sustainable competitive advantage through process innovation. They all share in common the successful execution on process innovations. What these case studies illustrate, as Michael Hammer recently wrote in the Harvard Business Review, is that "breakthrough innovations in operations – not just steady improvement – can destroy competitors and shake up industries." But as Hammer implies, other examples are not abundant.[1]

For any company, process innovation starts with creating and maintaining policies and procedures that drive competitive advantage. However, management is not measured on their creation of policy but on accountability for successful execution. Companies rely on business applications for this successful execution and innovation – which is equated to business change – often means change to these applications. Business logic is the bridge between policy and execution and the reason it is so difficult to innovate in operations is that it has been difficult for business to create and maintain the business logic that represents a companies policies.

To help solve this challenge, business rules need to be adopted now as business tools for execution and accountability – and sustained operational innovation.

The Cost of Business Errors and Mistakes

A principal reason why it is so difficult to innovate in operations is that the cost of business errors is so expensive. Testing for business errors and mistakes in the late stages of software development as it is done today is a poor substitute for preventing business errors and mistakes in the earlier stages of a project life-cycle for one reason: cost. Software errors cost an estimated $60 billion annually, according to the National Institute of Standards and Technology, a unit of the U.S. Commerce Department. According to Oracle Corporation, the cost of finding and fixing an error in the production phase of application development is often a thousand times more expensive than if it had been prevented during the scoping phase of the project lifecycle. In addition to internal delays with lost productivity and revenue, it is often customers who painfully uncover the business mistakes and errors, leading to significant financial or legal liability incurred by companies. As a recent case in point, Multidata Systems International Corp., a leading provider of radiation oncology products and systems, discovered it may be facing total damages in the range of $14 million to $28 million for 28 deaths resulting from incorrect gamma ray dosages for their cancer therapy product. This "business mistake" has been linked to business logic errors within the software that controlled administration of the dosages.[2]



Other examples include:

- **Consumer Lending:** A bank error causes a minor amount overdue discrepancy for a customer, which triggers a bank late fee, which after several months is reported to a credit bureau, resulting in the customer's credit record being damaged. Thousands of dollars per customer are spent reversing what was

[1] "Deep Change: How Operational Innovation Can Transform Your Company," Michael Hammer, Harvard Business Review, April 2004

[2] Can Software Kill?, eWeek Enterprise News and Reviews, Debbie Gage and John McCormick, Baseline, March 8, 2004

originally a simple business logic error. A business logic gap allowed this kind of damage. The total cost impact on the financial services sector from an inadequate software-testing infrastructure is estimated to be $3.3 billion.[3]

- **Insurance claims:** A mistake is made due to a gap in claim adjudication business logic and a workers compensation claim is paid. The error is detected later, but by law, the insurance company is responsible for the continued payment for the disability for the working life of the employee. As many as 25 percent of all filings may have some element of impropriety. The National Insurance Crime Bureau estimates that workers compensation fraud alone costs insurers $5 billion each year. This, in turn, is billed back to employers in the form of at least $6.5 billion of premium.[4]

Defining requirements is fraught with the inflexibility and gaps in the tools currently used by participants in different roles throughout the process. Process mapping tools, like Microsoft Visio, are helpful for business people, but too conceptual for the results to be useful for IT. Unified Modeling Language (UML) tools, typically used by IT, effectively capture the detail and technology information that IT works with, but are far too complex and specialized for business people to understand. There is no linkage, common language or traceability of the business motivation, goals and objectives with the detailed final documentation and execution. This makes collaboration on making any changes time consuming, frustrating, complex and susceptible to major business mistakes and errors.

Bring Business and IT Users Together With Rules-Driven Approach

A business rules approach offers a promising solution to these business mistakes, business errors and pain in achieving operational innovation. According to the Business Rules Group, an independent standards group of business and IT professionals, a business rule is a directive, intended to influence or guide business behavior, in support of business policy that has been formulated in response to an opportunity, threat, strength, or weakness. A business rule is expressed as an English language-like statement that satisfies the needs of both business users and IT: both can easily understand business rules and IT can easily convert them as needed into executable computer code. A business rule consists of decision criteria for evaluation and a corresponding action to be taken when the decision criteria are satisfied. For example:

> ***"If a customer has good credit, then assign a credit rate of 6"***

Business rules are also extremely cost efficient. One rule typically represents the equivalent of 100 lines of source code, which would take a developer two days to develop using more traditional methods.[5] A business analyst can easily write ten business rules per day, meaning that a business-rules approach can help development efforts realize a twenty-fold gain in productivity. Finally, since the business rules engine automatically generates the execution code on demand, the business rules approach provides unparalleled agility to meet changing market conditions.

Yet despite the compelling nature of business rules, they can be difficult to maintain. Problems arise when different business rules combine to produce results that were not anticipated during the modeling phase. The complexity within the chain of dependencies across functions and multiplied by the volume of business logic makes it nearly impossible to spot all the contradictions, loopholes and vulnerabilities that may exist.

A **conflict error**, for example, occurs when two business rules share the same decision criteria but call for different actions:

> ***If a customer has good credit then assign a credit rate of 6***
> ***If a customer has good credit then assign a credit rate of 8***

These rules, however syntactically correct, contradict each other; they would cause the arbitrary assignment of a credit rating of "6" to some customers and "8" to others. This intermittent kind of business

[3] Software Errors Cost U.S. Economy $59.5 Billion Annually, Department of Commerce's National Institute of Standards and Technology (NIST), Michael Newman, June 28, 2002
[4] Controlling the Costs of Workers' Compensation, MMC Views, Stanton Long, March 19, 2004
[5] The Living Transaction, Intelligent Enterprise, Presley Becerra, May 24, 2001

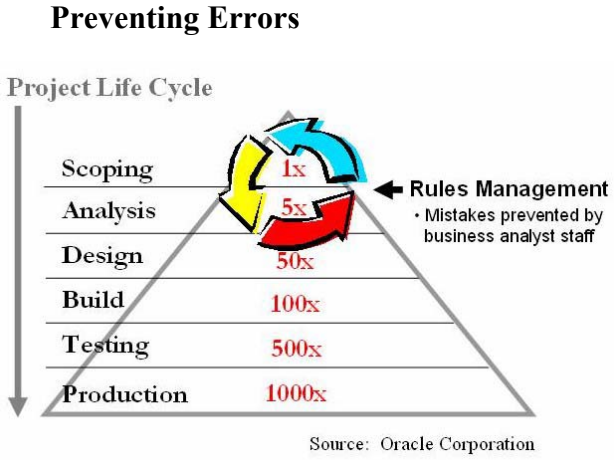
logic error is extremely difficult to diagnose with even state of the art testing tools. After the system goes live, it may be months with unknown losses of customers or unprofitable accounts until the error is detected and corrected.

Another type of business logic error is a gap in coverage. Rule coverage is incomplete if the conditions of all the rules in the rule set do not together account for all possibilities. For example, corporations are organized around “separation of duties” to avoid fraud. Sensitive transactions are decomposed into several smaller steps, which are executed by different individuals. Therefore, perpetrating a fraud would require collusion of several individuals. These steps and the authority of individuals are best represented as business logic. However, how would gaps in coverage within the business logic be found? Many such loopholes are not found until it is too late. The National Association of Certified Fraud Examiners reports that workplace fraud costs businesses more than $400 billion a year. The average organization loses about 6% of its total annual revenue to employee fraud and abuse.

Most rules products on the market typically do not assist in the identification and resolution of any of the potential business rule errors, such as conflicts and gaps, that may occur. At best, they show a log file of rules that the engine executed in production. The discovery and diagnosis as to the cause, identity and resolution of errors is 100% manual today and requires highly skilled and trained personnel usually with 6-10 years of rules expertise. Even with this formidable expertise, rules specialists typically are hindered by their lack of knowledge in the specific business problem. Ironically, business analysts, who are often regarded as being close to the industry and customers’ needs, are nevertheless marginalized due to the age-old barrier of technical expertise required.

Prevent Business Mistakes Across Both Rules and Workflows

Business Process Analysis (BPA) software, with rules management designed specifically for the needs of both business analysts and IT, automatically uncovers and helps resolve errors at the time of modeling, such as conflicts, collisions, gaps, overlaps, incompleteness and redundancy. Some companies are beginning to offer basic rule management capabilities, however the future will be with those that extend this capability across the combination of both rules and workflows natively within a single modeling tool. Representing business rules within the context of workflow processes not only provides business analysts with a comprehensive and intuitive view of a business process, but also enables error detection to be propagated across both rule and process interactions. This advanced business logic management encompasses analysis of process elements to identify missing input or output information that’s needed for a rule or process to execute as well as rule dependencies on the process elements. Alternatively, advanced business logic management will detect information defined in the process that will never be used, identifying the incompleteness of a model or the potential "disconnects" between contributors.



The effects of changes can be propagated throughout the business process to indicate upstream and downstream impacts. Business analysts also can visualize the relationships between different process elements by viewing a cross-section of the process organized by the chain of dependencies that exists between the different model elements rather than the logical flow. Global rules provide an opportunity to define formula and sequence-type business rules that apply to all processes in an organization and to help establish corporate policy. Whenever new processes are created and the process is analyzed, the formula and sequence enforcement is applied.

Business analysts can spend less time troubleshooting and more time implementing changes in business rules based on customer feedback, regulatory changes and competitive actions. The exciting thing about business rules is that a business rule engine can generate executable code automatically to create a

working application. This means that models validated with rules management are free from the distortion of business and technical errors and can now be used to run data sets run different business scenarios to document a business case.

Managing Rules: Reusable Rules, Updates and Versioning

It is estimated that a large number of business rules within current systems are duplicates resulting from copies of sections of programs or rule sets being made over time, for example, to address new products that are variations on existing products. Rules analysis also detects individual rule errors contained within different rule sets throughout a business process. This enables new techniques for further reducing complexity so that business analysts can focus on business solutions. Just as a complex mathematical equation can be factored into its basic prime elements, rules can be organized into reusable rule sets. The rule management system can then validate the interactions between these reusable rule sets.

Having all business rules in one place provides a holistic view of a business process and further leverages the power of rule management. A true business logic management repository should provide a centralized storage of a full range of business logic regardless of the execution environment. Version control, access control and other features track changes and updates, manage the deployment of processes and foster collaborative efforts by teams of analysts. The repository should have the ability to translate and distribute rules to other environments for execution and avoid the maintenance costs due to duplication of business rules in parallel locations, such as the same data validation rule used in web, telephone and email interfaces.

Managing Rules: Ease of use and collaboration

With the elements of analysis, organization and visualization, the skill level required to use these new innovative tools are now similar to those of an Excel spreadsheet. In fact, the rule-writing interface has the familiarity of an Excel spreadsheet to provide a business analyst the ease of use of this office product. Other key characteristics of a solution that bridges the gap between business and IT include:

- Linkage of the business purpose of a rule set to the individual rules that combine to achieve these goals
- Governance of business rules to assign stakeholders, stewards, governing party and reviewers so that a committee can be organized to manage the process of change
- Traceability of rules from their source including status, confidence and transition of the business rule to facilitate committee review and approval
- Incorporation of manual activities to capture exception handling for process improvement feedback

The Future of Business Rules Management

Returning to the question, if business management creates and maintains the policies within an organization, why can't business create and maintain the business logic that represents these policies? In the '70s and '80s, computers, word processors and scheduling software simplified the skill, coordination and time barriers that enabled managers to type their own memos and manage their own appointment calendars. Not only did this reduce costs and improve efficiency, but it also shortened business cycle time. In fact, the composition of the workforce has restructured to provide more meaningful and productive jobs. A similar transformation is in process today to enable businesses to manage the creation and maintenance of business logic that drives applications. A new flexible infrastructure technology, called business rules-driven Business Process Management (BPM), is poised to have the same enabling impact on corporate America's infrastructure and workforce.

Steven Minsky is the Founder and VP of Marketing of RulesPower, Inc. a leader in rules-driven Business Process Management and prior to RulesPower, the pioneer at Kodak's Eastman Software subsidiary of their next generation BPM software product. Minsky graduated with an M.B.A. from the Wharton School of Business, an M.A. in International Studies, from the Lauder Institute at the University of Pennsylvania and received a B.S. in Engineering from Tufts University.