Transitioning to a business rule management service model: Case studies from the property and casualty insurance industry

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A B S T R A C T

As the volume, sources and types of business rules continue to grow, so do the needs of organizations to accurately, consistently and effectively manage rules. Increasingly, firms seek business rules management systems (BRMS) for assistance. Although studies have examined BRMS technical considerations, few have examined management considerations of deploying and managing BRMS projects. This study addresses this gap through examination and comparative analysis of BRMS deployments. Qualitative case study methods are employed and findings suggest a common deployment methodology and emergence of tightly structured services model. Participant's adoption drivers, consequences of deployment, IT alignment and transitions to IT service-orientations are provided.

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1. Introduction

Effectively managing business rules across systems, processes and business units are becoming a higher priority in many firms [25]. Organizations have found it necessary to develop ways of managing business rule churn due to new or changed rules from government legislation, business competition, regulatory agencies, industry norms and others. Adding to these challenges include increased web-based and global competition making it essential for firms to continuously monitor and rapidly respond as competitive threats emerge. Furthermore, the sheer number of channels to manage business rules continues to rise, be it legacy, web, wireless systems or otherwise thus necessitating consistent, accurate and synchronized rule updates across families of related systems. When one considers the volatility to which business rules are added or changed in businesses that transcend time zones, seasons, statutory boundaries and channels, the complexity of business rule management grows on an exponential basis.

Fortunately, research and development has been conducted in academia and industry towards the development of automated business rule tools and techniques. For example, rule mining tools sweep through legacy program code, user manuals and other business documents to assist in the discovery and externalization of business rules. Business rule management systems (BRMS) have also been developed to assist with implementing and integrating business rules across information systems. In addition, methodologies have been developed to assist in business rule modeling, authoring, updating and maximizing rule reuse. More recently, studies have been published that advocate the establishment of business rules as a distinct layer in a services orientated architecture (SOA) [11,30]. Collectively, this research and development has begun to pay-off for organizations. Common benefits of effective business rules management have included firm-level agility, rapid rule updates, improved multi-channel management, greater control of business rule updates by the business staff, reduced system development time, in addition to significant improvements in rule consistency, accuracy and reliability [20].

Despite these significant technical orientated developments, little has been published regarding managing business rule projects and more specifically viewing business rules from a service science perspective. For example, *how do organizations manage their BRMS development and deployment efforts? How are organizations structuring their support units for BRMS and what is the balance between IT and business staff? What benefits can be gained from viewing business rules from a service science perspective?* Business rule management solutions are a quintessential illustration of an intersection between technology, people and business processes. Yet, with so much emphasis towards the technological aspects, we can lose sight of the management of information

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system considerations. As with many developments in the IT industry, it is the management of the technology and not the technology itself that presents the most significant challenges. Evidence is growing in the business press that this is occurring as it relates to developing and deploying BRMS [21,23].

To address these research questions, this study will examine five implementations of business rules management solutions in different firms from the same industrial group. We examine the underlying business drivers, scope changes, support roles, staffing levels, project management techniques, business–IT alignment and consequences of deployment. Although relevant differences between the firms are noted, the thrust of the findings suggests the use of a common implementation approach of business rule management solutions by the participating firms. This synthesized implementation approach is diagrammed, defined and referred to as the business rules deployment maturity model. The authors contend that this implementation approach is illustrative of the approach that firms may consider as they add business rule (BR) service delivery lines in their IT support units.

The paper is organized as follows. A literature review is presented in Section 2 that reviews key related research streams, including business rules management, application integration, IT alignment and offers a view of business rules management from a service science perspective. Section 3 provides the research methodology and setting and Section 4 outlines key findings from the study. Section 5 discusses the results and provides comparisons of our findings to the literature review. Finally, the study's conclusions and recommendations for future research are provided in Section 6.

2. Literature review

The modern-day understanding of business rule management solutions has their derivation from the artificial intelligence and expert systems arenas [27]. Researchers and developers alike began to realize the practical real-world applications of the technology as a simple rules-based interpreter, led prominently through the RETE algorithm [9], and by the mid to late 1980s the business rules segment began to distinguish itself. In fact, it was during this timeframe that initial development of the now dominant modern-day BRE commercial products began in earnest: Gensym Corporation's G2 in 1986, Haley Systems, Inc., in 1989, ILOG SA in 1985 and Blaze Advisor™ in 1988.

Since these early days, a ground swell of research, development and standards setting has emerged in the business rules management area. The BRMS market is expected to grow to a half billion U.S. dollars in annual product sales with more than 40 vendors worldwide by 2010 [14]. Furthermore, organizations like the *Business Rules Group* and the *Business Rules Community* have been formed to provide cross-industry support, lessons learned, end-user forums and conferences. Higher order standard setting organizations have taken notice with the charter of the *Rule Interchange Format Working Group* by W3C in 2005 and the release of the *Semantics of Business Vocabulary and Business Rules* (*SBVR*) standards in 2006 by Object Management Group.

From a research perspective, distinct research streams have emerged that provide insights ranging from BR authoring, engines, rule mining, and others. Fundamentally, a business rule is defined as "*a statement that defines or constrains some aspect of the business. This must be a term or fact (described as a structural assertion), a constraint (described as an action assertion), or a derivation. It is 'atomic' in that it cannot be broken down or decomposed further into more detailed business rules. If reduced any further, there would be loss of important information about the business.*" Halle defines the *business rules approach* to systems development as that which "*allows the business to automate its own intelligent logic better, as*

well as to introduce change from within itself and learn better and faster to reach its goals" [13].

Business rule authoring is one such stream widely researched, with studies examining rule meta-modeling [36,28], authoring [4], authoring interfaces [12], and several applied rule analyst manuals. Business rule engines (BRE) is another research stream, including BRE effectiveness [15], performance and extensive commercially developed business rule engine literature available from vendors such as ILOG, Blaze, Pega Systems, Mindbox and others. Harvesting and the mining of business rules have also been examined [7], as well as their similarities to knowledge management [22], data mining [26] and artificial intelligence. Collectively these provide significant insights into business rules, but the studies largely focus on technical issues, providing little examination of management of business rule implementations such as support levels, scope management, deployment consequences, and effective project management. Similarly, the underlying business drivers of firms to adopt the business rules approach has been studied, including select case studies for build-to-order, customer order scheduling, but they often ignore management of the technology considerations, including IT to business staff alignment, maturity models, development methods, transitioning to a services-orientated IT support organization and others.

Business–IT alignment, for example, has proven to be an important consideration in BRMS projects. Since legacy systems traditionally have business rules buried directly in their application code, the ownership and control over administering BR updates between the IT and business staff if frequently a point of contention. The execution of BR updates and maintenance has historically required the use of the IT staff over prolonged time periods. In effect, this handed control of BR maintenance to IT since the business staff would be forced to wait days (and sometimes weeks depending on the size/complexity of the program) for the IT staff to make the changes, test, and re-deploy the remediated application. This lag time resulted in the business staff viewing IT as an obstacle in BR maintenance, and would give rise to end-users re-prioritizing, disengaging or even circumventing established BR maintenance procedures for more time-sensitive, but sub-optimal, work around solutions. This loss of control by the business staff and a lengthy BR update process are frequently cited drivers of firms to adopt BRMS. The degree of top management support from both the business and IT staff is an important consideration as well. In a recent survey of CIOs (Chief Information Officers) from 2004 to 2005 through 2008, the percent of CIO organizations that reported directly to the company CEO (Chief Executive Officer) has risen from 40% to 47%, while the level of IT spending by large corporations increased from 4.0 to 6.6 as a percent of annual revenues from 2002 to 2006 [6]. This combination of higher corporate visibility and greater capital responsibility may affect the IT organizations ability to deliver BRMS project success. Studies such as the Business–IT Alignment Maturity Model outlines five levels (*ad-hoc, committed, focused, managed to optimized*) and numerous metrics (ranging from skills assessments to competence and communication levels) and provides a useful tool for overall measurement of this business–IT staff alignment and maturity [17]. Furthermore, studies have been conducted that provide needed insights into the ideal IT leader, including effective IT governance techniques and approaches [29] could also provide insights into managing this balance of control during BRMS deployments.

Another important consideration is examining the development and systems integration methods utilized by firms when deploying BRMS. According to a recent survey, the top priority of CIOs (Chief Information Officers), has remained much the same during the five years from 2002 to 2006, which is *integrating systems and business processes*. Case studies that examine the