Navigating a Complex Regulatory Landscape: Key Principles of a Holistic Compliance Solution

The increasing cost of regulatory compliance

Regulatory compliance impacts almost every enterprise, irrespective of its size and scale or the geography and sector in which it operates. Managing and demonstrating compliance with the complex web of evolving regulations can be time consuming and expensive. For example, the Volcker Rule was implemented by U.S. federal financial regulators to curtail proprietary trading and private fund activities of U.S. and non-US banking groups. It has resulted in a 70 page report and 900 pages of supplementary information regarding regulations that need to be complied with by July 21, 2015. Non-compliance with regulations may not only result in severe financial penalties but also risk the organization’s reputation. It may, in some cases, lead to extreme consequences such as closure of business.

With an increasing number of businesses coming under the purview of external regulators, the regulatory landscape is likely to become all the more complex in the future. This means that non-compliance is not an option. In fact, compliance ranks high as an area of concern for a majority of CEOs and enterprises continue to spend heavily on ensuring adherence. Annual regulatory outlay within the U.S. alone is approximately USD 2 trillion. Banks in the U.S. spend close to USD 15 billion every year on regulatory compliance.

This paper highlights the challenges with the current approaches used by the industry and the research community to achieve regulatory compliance. It also outlines the key requirements for implementing an effective compliance solution that brings together the benefits of a document-centric as well as a formal approach.

The current approach to regulatory compliance: challenges and limitations

The challenges around regulatory compliance have been receiving attention from both the academia and industry practitioners. However, current approaches to address them are disconnected and effort intensive.

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As shown in Figure 1, the current industry practice is to leverage Governance, Risk, and Compliance (GRC) frameworks for managing the regulatory compliance process. GRC frameworks are typically document centric and offer navigation support within and across documents. Since two documents may refer to the same concept using different labels, a team of legal and domain experts need to work together to identify the relevant areas for the enterprise. They also need to establish the traceability links between these documents.

Moreover, existing GRC frameworks do not support automated checking of compliance, nor do they suggest what needs to change or where to improve compliance. Typically, checking adherence to compliance requirements necessitates leveraging data such as the execution trace of a business process and the audit trail of a transaction processing application. The team of experts has no recourse but to manually examine the data to validate its consistency with respect to specific interpretation of regulations.

On the other hand, the research community focuses purely on automation. The most promising approach is the use of deontic and defeasibility logic for automated compliance checking. The idea is to express the desired interpretation of regulatory text as constraints in terms of a formal language, and treat the data for the business process (or other entity that needs to be checked for compliance) as facts. While this approach makes it possible to provide ‘yes’ or ‘no’ answers regarding regulatory compliance in an automated manner, it addresses only part of the problem. The major gap is its inability to make a non-compliant enterprise compliant. Also, the jury is still out on the scalability and robustness of the formal approach.

Regulators usually keep the regulatory text intentionally generic so as to be applicable to all possible ‘regulatees’ in a domain. Therefore, the major challenge is in arriving at regulatee-specific interpretation. In the absence of appropriate tools, a team of legal and domain experts is needed to ensure the correctness, completeness, and consistency of regulatee-specific interpretation. Given the size and scale of modern enterprises and the complexity of regulations, this could be a time-, effort-, and cost-intensive endeavor, as well as intellectually demanding.

The recommended solution: a holistic and automated compliance solution

The ideal solution to achieving regulatory compliance would be one that checks for compliance automatically and provides precise help in addressing a specific instance of non-compliance. It must also support negotiation for effective risk management, eliminate semantic mismatch, and reduce the burden on legal as well as domain experts. In addition, it should be implementable through a combination of robust, scalable, and usable tools that have been integrated through an easy to use method. Figure 2 shows the desired approach with the key elements (missing from current approach) highlighted in green.

![Figure 2: Desired regulatory compliance solution](image-url)
By judiciously integrating the existing documentation centric and academic approaches, the solution must be designed along the following lines:

**Leveraging semantic vocabulary**: This addresses semantic impedance between legal and enterprise systems. As a result, traceability links between regulations and enterprise specifications are not just navigation aids between the two, but can also be used and checked based on the chosen semantics.

**Using appropriate specification language**: Using a language such as DR-Prolog for capturing the desired interpretation of regulatory text in a formal manner can be advantageous due to two reasons. Firstly, a robust, scalable, and open-source implementation of DR-Prolog exists. Secondly, it produces a ‘proof tree’ which is useful in determining what needs to change and where, in order to address a specific non-compliance.

**Balancing cost of compliance**: Enterprises operating in a dynamic business environment must keep pace with multiple change drivers, including regulations. It therefore becomes critical to demonstrate compliance within a short window of time, in a cost-effective manner. Ideally, the cost of checking for compliance should be proportional to the change being introduced in the enterprise or regulatory texts or both.

**Automating compliance validation**: Successful integration of documentation-centric and formal approaches hinges on correct specification of the desired interpretation of regulations using the chosen formal language. An automated validation mechanism will greatly reduce the burden on experts.

Organizations can accrue several benefits by applying these key principles while designing and implementing the recommended solution for regulatory compliance. It leads to faster and cost-effective compliance checking. A more holistic approach also reduces the burden on legal and domain experts during the transition from non-compliance to compliance. It also supports the operationalization of expertise and experience in the form of customizable regulatory compliance offerings.

**Beyond compliance: unlocking business value through regulatory compliance**

Enterprises that operate in highly regulated industries are constantly playing catch up with changing regulations. For companies entering new markets or launching new products, this may become all the more challenging. As companies grapple with the costs and efforts required to establish robust compliance programs, they must evaluate compliance requirements against their risk profile and specific business needs.

Organizations should go beyond ensuring compliance to unlocking opportunities for strengthening business performance through proactive strategic measures. The right compliance solution can not only help companies adhere to tightening regulatory standards but can also uncover value through benchmarking, application of best practices, and better internal control.

**About the author**

Vinay is Chief Scientist, TCS Innovation Labs - Pune (Tata Research Development and Design Center). His research interests include enterprise modeling, model-driven software engineering, and self-adaptive systems. His work in model-driven software engineering has led to a toolset that has been used to deliver several large business-critical systems over the past 15 years. Much of this work has found its way into Object Management Group (OMG) standards. Vinay has served as the conference and program chairperson for the premier ACM and IEEE international conferences in the area of software engineering. Vinay is a Visiting Professor at Middlesex University, London.

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