LAB49

FINRA Request for Comment on Fintech Innovation in the Broker-Dealer Industry

Development of a Taxonomy-Based Machine-Readable Rulebook

Submitted on 12 October 2018

LAB49

October 12, 2018

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Jennifer Piorko Mitchell
Office of the Corporate Secretary
FINRA
1735 K Street, NW
Washington, DC 20006-1506

Re: Special Notice; FINRA Requests Comment on Financial Technology Innovation in the Broker-Dealer Industry

Dear Ms. Mitchell:

Lab49, Inc. ("Lab49") appreciates the opportunity to provide our comments to the Financial Industry Regulatory Authority ("FINRA") on Financial Technology Innovation in the Broker-Dealer Industry.

Lab49 is a global strategy, design and technology consulting firm specializing in capital markets. With over 16 years of experience executing on our clients' most critical technology initiatives across the Americas, EMEA and Asia-Pacific we strongly believe that the future of financial services regulation is linked to machine executable rulebooks and common industry ontologies.

Two sections below detail our responses to the questions posed in FINRA's Special Notice about the uses of machine-readable rulebooks and development of the common taxonomy.

1 Uses of Machine-Readable Rulebook

Who is likely to benefit if FINRA were to develop a machine-readable rulebook using an embedded taxonomy? For what purpose would it be used by market participants? What types of market participants would be most likely to use it?

Lab49 sees three beneficiaries of a machine-readable rulebook using an embedded taxonomy – regulated firms, investors, and potentially other regulators:

1. **Regulated Firms.** Clearly, regulated firms that adopt a machine-readable rulebook will be the primary beneficiary. They will be able to realize enhanced operational and compliance efficiency, in addition to a reduction in operational and financial risk, resulting in improvements in overall cost structure.

2. **Investors.** Lab49 foresees that the investing public will benefit as well. Improvements in cost structure would be passed through to investors through more competitive pricing and service enhancements. As adoption increases, investors will continue to benefit through greater standardization and outcome certainty across a range of client interactions among participating firms.

3. **Regulators.** FINRA will benefit in much the same manner as firms that adopt the rulebook and taxonomy. Data ingestion, processing and analysis could be streamlined, leading to efficiency gains. Semantic misalignment issues between FINRA and adopting firms would be minimized due to the shared taxonomy and rule disambiguation, resulting in a reduced need for issue resolution. Additionally, other regulators, both domestic and overseas may potentially benefit as well depending on the degree of harmonization across policy domains.

Market participants would likely utilize the rulebook and taxonomy across a range of use cases. They could use it to automate the evaluation of whether regulatory obligations exist for any given market activity, for example an RFQ or an execution, or systematically determine if the obligations have been fulfilled when an obligation exists. They can also use it to automate the activity that is now highly manual such as employee registration, resignations and sanctions.

At one end of the spectrum, firms may simply utilize the embedded taxonomy to inform decisions with respect to model representations of their internal information systems. Other firms may fully adopt the machine readable rulebook and taxonomy to maximize efficiency and risk reduction. In reality there will likely be an adoption curve both for firms and the degree to which they integrate with the rulebook and taxonomy.

All market participants could benefit as software vendors would use machine readable rulebook and taxonomy to develop products that would help participants to identify and execute their regulatory obligations. Although larger firms have greater resources and may decide to develop these capabilities internally, they are also often encumbered by legacy processes, technology and culture that inhibit agility. Other firms would benefit from vendors using the rulebook and taxonomy in their products. However, firm size alone may not be a differentiating variable in predicting the type of firm most likely to use a machine readable rulebook and taxonomy. Other factors, such as maturity of governance regimes for data and rules management within a firm, the degree of pre-existing harmonization between enterprise canonical models and the embedded taxonomy, as well as overall technical agility would likely be better determinants for the types of firms that will lead the adoption of a machine-readable rulebook.

Would firms or third-party service providers seek to develop tools to interact with a machine-readable rulebook? Would such a rulebook assist with compliance efforts? If so, in what ways would it make compliance more efficient or effective?

In other industries such as mortgage banking and insurance, third party service providers (TSPs) help smaller firms and mid-size firms automate compliance with respect to underwriting rules, and this model will likely prevail in the case of FINRA. Even larger firms will make build vs buy decisions informed by multiple dimensions, such as functional coverage, time to market, total cost of ownership, integration with internal systems and processes, vendor risk, etc. TSPs are keenly aware of these decision points and market dynamics, and will provide compelling buy options.

Compliance efforts are typically constrained by the extent to which financial and technology controls are manual and detective, as opposed to automated and preventive or predictive. To the extent that a

machine-readable rulebook and taxonomy can automate these controls and prevent exceptions, it can improve not only the efficiency, but also the effectiveness of compliance efforts. Additionally, from an audit perspective, control automation can in turn enable automated testing of controls and generation of evidence, further streamlining these processes.

Is there a risk of over-reliance on output provided by a machine-readable rulebook, such that insufficient analysis may be done by individuals? What measures, if any, could be taken to limit the potential for over-reliance?

Although a codified set of rules can be highly effective in the majority of cases, no model can fully anticipate every permutation of real-life scenarios. There will be areas of ambiguity and situations where human judgment is required. There is always the risk of over-reliance on the model to the detriment of situational context. Additionally, as the industry evolves, technology advances, modes of communication and other factors change, the risk of model obsolescence increases.

Measures to mitigate the risks of over-reliance may include:

1. Procedures to manually review rule outcomes, both at the regulated firms and at FINRA.
2. Procedures for scenario testing. If the discovery and execution of compliance obligations is automated, scenarios can be defined to ensure that the systematic evaluations resulted in the correct/expected outcomes. Extreme scenarios can also be defined.
3. Procedures for change management for the rulebook and taxonomy that incorporate feedback from regulated firms.

2 Development of Common Taxonomy

As noted previously, certain regulators have developed, or are considering developing, a taxonomy-based machine-readable rulebook. What are the potential benefits and challenges associated with developing a consistent or harmonized taxonomy across regulators? What regulatory areas would have the greatest benefits or challenges from any such harmonization?

Lab49 foresees four key benefits from developing harmonized taxonomy across regulators – clarity, data quality, cost and timeliness.

1. **Clarity.** Implementation of the sufficiently detailed common taxonomies will improve clarity and comparability of the information submitted to different regulators. It will help regulators and investors to analyze information and build accurate picture of the company.

2. **Data quality.** Implementation of the common taxonomies will improve the quality of the data submitted to regulators because of the reduced risk of data mapping errors during information creation, retrieval or exchange. It will help regulators and investors to analyze information and build accurate picture of the company and across the companies.

3. **Cost.** Implementation of the common taxonomies will reduce the compliance costs for regulated firms because of the reduced number of the data mappings required during information creation, retrieval or exchange. Subsequently it will help with innovation lowering the cost of compliance for the new market entrants.

4. **Timeliness.** Implementation of the common taxonomies will reduce the amount of time required by the regulated firms to implement regulatory changes by minimizing the number of data mappings. It will lower the systemic risk and risk to investing public.

We see three challenges that come with these benefits – agility, complexity and governance.

1. **Agility.** Common taxonomy requires collaboration between multiple groups, potentially making it time consuming to reach agreement.

2. **Complexity.** There are multiple existing taxonomies already in place for business rules, products, legal documents and so on. Resulting common taxonomy might result in higher complexity for base use cases as it needs to cater to the most nuanced one. Further, there is a risk of complexity being hidden behind the façade of the superficial commonality.

3. **Governance.** Common taxonomy requires collaboration between multiple groups - regulators, SROs, standards setting bodies, regulated firms and so on. Solid governance needs to be agreed between these parties.

The greatest impact of the harmonized taxonomy will be in the areas where the same concepts have to be reported by regulated firms to multiple regulators realizing most of the clarity, data quality, costs and timeliness benefits. Specific areas where the benefits will be the greatest are capital adequacy, liquidity risk and sanctions on companies and individuals.

Absent the development of a consistent or harmonized taxonomy across relevant regulators, would the creation of a machine-readable rulebook by FINRA be useful? Are there technology tools or processes that decrease the need for a consistent or harmonized taxonomy?

Firms registered with FINRA currently rely on manual interpretation of the rules to drive the quality of the submitted information. In one study, adopting machine executable rules for validation of the financial reports by XBLR DQC reduced error rates in reporting submission by 64%[1]. It appears, therefore, that even

[1] See XBRL US press release, SEC Filers Decreased Errors by 64 Percent by Using Data Quality Committee Validation Rules https://xbrl.us/news/dqc-20160531/ (May 31, 2016)

unilateral adoption of the taxonomy and machine-executable rulebooks will improve quality of the data made available to FINRA by regulated firms.

We believe that the use of Semantic Web standards including Reference Data Framework (RDF), Reference Data Framework Schema (RDFS) and Web Ontology Language (OWL) to define taxonomies will decrease the need for a harmonized taxonomy across the regulators. Because of the "Anyone Can Say Anything" approach of the Web, Open World and Nonunique Naming assumptions, this set of standards will allows individual regulators to define the terms and manage differences in terms definitions created by other regulators.

Reuse of existing ontologies such as Financial Industry Business Ontology (FIBO) and Simple Knowledge Organization Systems (SKOS) will simplify the mapping between the terms created by different regulators since these ontologies are widely supported by the data mapping tools.

When creating and managing the mappings between taxonomies adopted by different regulators two metaphors can be useful - Software Development Lifecycle (SDLC) and Reproducible Research.

1. **Software Development Lifecycle (SDLC).** Ontologies and rules are a kind of data and a kind of software making SDLC metaphor applicable. Open Source Analyze-Build-Test-Integrate-Run lifecycle can be adopted along with appropriate tools to develop, test and publish taxonomy mappings.

2. **Reproducible Research.** Ontology and rule development can be treated as a research process, making Reproducible Research metaphor applicable. Open Source Reproducible Research pipeline with reproducible workflow and technology environments can be adopted to publish taxonomies and the regulation mapping creating the transparency needed for feedback from vendors and regulated firms.

What role should vendors and regulated firms play in the adoption, development and ongoing taxonomy maintenance?

With FINRA playing the role of overarching governance of the taxonomy, that is exercise of authority and control (planning, monitoring, and enforcement) over its management[2], regulated firms should have the opportunity to collaborate and provide input into the meanings, expressions, and relationships of the concepts making up the taxonomy. As the primary interface with investors, regulated firms can provide a valuable perspective in terms of evolving client interactions or other business aspects that may not be well represented in the taxonomy. It's vitally important to have the voice of the regulated firms involved in order to maximize adoption.

With respect to vendors, they can also play a valuable role in helping guide ontological choices that may impact current integrations or simplify future implementations. Vendors have a unique insight into the specific use cases that their clients are interested in, and can aggregate these ideas and prioritize them with respect to how the taxonomy can be leveraged to meet these use cases.

As a case study, when Freddie Mac instituted the development of a Business Data Dictionary (which eventually was incorporated into the industry MISMO standard) and a Business Rules Management System, external vendors provided key inputs into ontology and systems development, as well as specific taxonomies for the various lines of business. Vendor expertise and thought leadership, along with implementation experience across industries accelerated not only the technical delivery but also organizational maturity in terms of adoption of these frameworks and tooling.

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[2] See Data Management Association (DAMA) definition of data governance. The DAMA Dictionary of Data Management, 2nd Edition. https://dama.org/content/dama-dictionary-terms (March 11, 2011)

3 Closing

Lab49 appreciates the opportunity to comment on the Special Notice and would be happy to share its perspective on how FINRA can play a leading role in the maturation and adoption of machine-readable rulebooks.

To learn more about our perspective and how Lab49 can help, please contact Dave Leonard at dave.leonard@lab49.com.

Sincerely,

Dave Leonard, Associate Director of Client Solutions
On behalf of Lab49