



July 24, 2018

Mr. Christopher Kirkpatrick  
Secretary of the Commission  
Commodity Futures Trading Commission  
Three Lafayette Centre  
1155 21<sup>st</sup> Street NW  
Washington, DC 20581

Re: Request for Input on LabCFTC Prize Competitions

Dear Mr. Kirkpatrick,

Credit Suisse ("CS") appreciates the opportunity to provide the Commodity Futures Trading Commission ("CFTC") with a response to the request for information ("RFI") seeking public comment on the Commodity Futures Trading Commission's ("CFTC") prize competitions.<sup>1</sup> CS supports LabCFTC's efforts to spur innovation through prize competitions in the US, and we encourage the CFTC to continue their engagement with regulators in other jurisdictions who have implemented similar events (e.g. hackathons, techsprints, etc.). We have focused our comments on the RFI's suggested competition topic of "Improving the Accessibility of CFTC Regulations" through the use of machine-readable regulations.

In our response to CFTC's request for input, we have directed our comments towards a machine-readable regulation framework, which encompasses the creation of common ontologies for the rules and a visually interactive representative of the regulatory framework.

We find the below recommendations will both contribute to and harmonize regulatory requirements using new technologies such as artificial intelligence ("AI"), neural networks and machine learning ("ML"). The application of these technologies for machine-readable regulations will help firms effectively meet their regulatory requirements, while potentially reducing costs and increasing efficiency.

**I. Machine-Readable Regulation Framework**

Emerging technologies such as artificial intelligence, neural networks and machine learning can help regulators increase efficiency as these types of technologies mature. CS supports a machine-readable regulation framework, as it is the most efficient way to achieve the target state of automated regulatory reporting. Achieving effective machine-readable regulation is dependent on the data quality and the standardization of participants as well as the internal complexity of existing reporting rule sets. Firms that operate regionally and globally will need to develop a common data element that can be applied consistently within their firm and across jurisdictions.

Implementation of machine-readable regulation rules can be varied across jurisdictions. The machine-readable regulation framework process will analyze the subset of semantics of business vocabulary defined in regulatory documents, taxonomies and the ontologies. Credit Suisse suggests the use of a flexible, feature-rich and expressive standard like the Semantics of Business Vocabulary and Business Rules ("SBVR")<sup>2</sup> to publish the regulations, which support human-readable and machine-readable publications from a common specification.

---

<sup>1</sup> See CFTC request for information (RFI) on "LabCFTC Prize Competitions." Published on April 25, 2018.

<sup>2</sup> SBVR is an OMG managed standard, designed for rule management <https://www.omg.org/spec/SBVR/About-SBVR/>

In addition, the allocation of significant resources by both the public and private sector to advance the adoption of technology solutions for implementing regulatory improvements is needed and will require early and open engagement between regulators and industry. These resources and collaborations are key, as challenges will likely be encountered if there is a large-scale overhaul of the existing reporting technology infrastructure in favor of a technology solution such as machine-readable regulation.

CS recommends that machine-readable regulation be interoperable with the ability to be integrated into a firm's existing regulatory environment. Firms that operate regionally and globally will need to develop a common business vocabulary that can be applied consistently within the firm and across jurisdictions.

## II. Common Ontologies for the Rules

The biggest opportunities emerging from new technological innovations are machines with the potential to understand regulatory requirements through vocabularies and ontologies as defined by regulators in collaboration with industry. The use of machine learning algorithms and neural network models are making it possible for machines to learn regulatory documents' vocabularies, enable unknown linkages, and provide insight into the regulation. In order to achieve these goals, communication and cooperation between regulators, both domestic and international, and industry would be needed in order to develop industry-wide standardization and definitions for the ontology and glossary for key regulations.

The critical processes for making regulation machine-readable are: the extraction of the text that is necessary to fully understand the regulation; mapping the text to an existing vocabulary as well as possibly expanding the vocabulary; and identifying what deliverables the published regulation requires.

CS is currently working with a US university on a proof of concept ("POC") with the aim of developing a machine-driven analytical solution for implementing and complying with regulations. Within the POC, the key questions that will need to be answered include:

- What is the **body of words** in a new policy or regulation?
- What is the **meaning** of each word?
- What are the **relations** between the words?
- What are the **decisions** of the policy /regulation?

The POC uses an artificial intelligence feed forward neural network (FFN) to find the relationship between the set of input values with the set of output values, Word2Vec neural network to convert the dictionary of texts into numerical values, and Word-embedded models to convert and understand the regulatory documents.

Figure 1 (below) represents the process of extracting content from the regulatory documents. Data source and data pre-processing are key steps in gathering all the regulatory contents for the extraction. The analytical modeling phase of the activity provides the ability to apply different modeling techniques and neural network models to extract comprehensive and relevant intelligence out of the regulatory document. Visualization allows us to better understand insights of different model results and to communicate these insights to others.

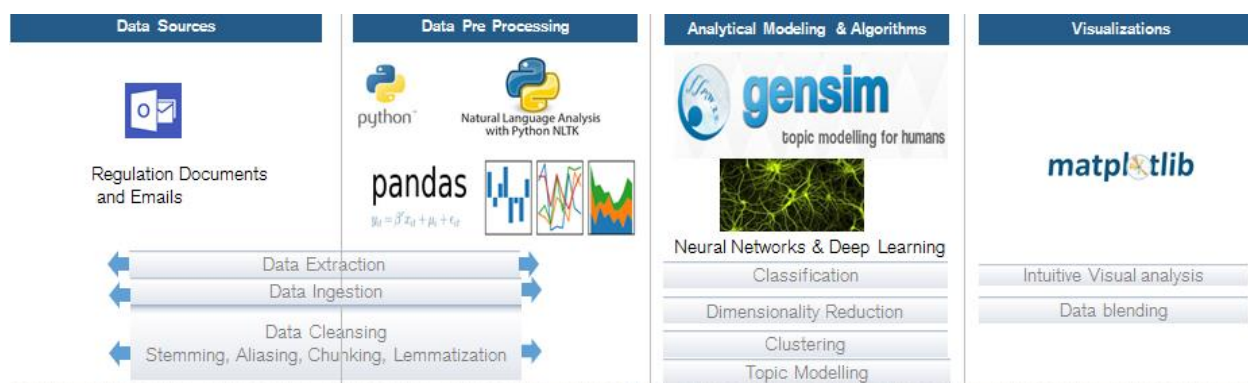


Figure 1<sup>3</sup>

### III. Visual Representation of Regulatory Framework

CS recognizes that digitalization has created a tremendous opportunity for regulators and the industry to work together and streamline accessibility to and compliance with regulations. For example, publishing industry-specific regulation through a common platform can push specific, detailed and relevant content to firms. CS endorses the following key points that are crucial for producing appropriate and effective results when making regulations machine readable:

1. Regulations should be market and principles based (i.e. designed to achieve its objective and compliance in the most effective way).
2. Regulations need to be flexible and quickly adaptable in order to accommodate rapidly changing markets. Regulations should also create confidence and certainty in the regulatory regime, so firms may take risk-appropriate steps in pursuing innovative technologies.
3. New regulation or changes in policy should follow a bottom-up approach (i.e. industry and regulators working together on regulation).
4. A common data model for all firms to report their data for compliance reporting and other granular reporting is needed. This will ensure an efficient and transparent reporting process and reduce the firms reporting costs.

### IV. Structuring the Prize Competition

CS supports international regulators collaborating in the FinTech space. Communication and engagement creates a space for regulators to learn from one another and potentially incorporate similar approaches when furthering innovation efforts in their home countries, while at the same time allowing international firms the opportunity to further their innovative efforts across the globe. We recognize and appreciate that each regulator faces unique sets of opportunities and challenges, which will lead to nuanced differences across jurisdictions. However, we also believe that other jurisdictions could draw from, and expand upon what is already being implemented in other countries (e.g. hackathons, techsprints, and sandboxes). CS supports LabCFTC's ongoing engagement with international regulators in fostering innovation.

CS has participated in three techsprints with the Financial Conduct Authority ("FCA") that focused on improving regulatory reporting, machine-executable regulations, and anti-money laundering and financial crime. On machine-executable regulations, CS is participating in a pilot with the FCA and the Bank of England that is collaborative across industry, sectors, and regulators. The pilot focuses on finding solutions in a timely and cost-efficient manner.

<sup>3</sup> All the tools mentioned above are open-source tools. An open-source license is a type of free computer software and other products that allow the source code, blueprint or design to be used, modified and/or shared under defined terms and conditions. Open-source licenses may have some restrictions, particularly regarding the expression of respect to the origin of software, such as a requirement to preserve the name of the authors and a copyright statement within the code, or a requirement to redistribute the licensed software only under the same license.

## **V. Conclusion**

We support LabCFTC's efforts to facilitate a prize competition focusing on innovation. Specifically, on the topic of "improving the accessibility of CFTC regulations", CS acknowledges there is significant benefit in working together with regulators and industry to enhance regulatory compliance. Potentially inserting technology into the regulatory compliance regime by automating and streamlining more of the process will allow firms to more effectively adhere to compliance requirements thus enhancing regulators' oversight of the markets while simultaneously reducing costs associated with regulatory reporting.

\*\*\*

We thank the CFTC for the opportunity to provide our input. If you have any questions, please do not hesitate to contact the undersigned or Joseph Seidel at 202-626-3302.

Erik Barry  
Director, Futures and OTC Client Solutions  
Credit Suisse Holdings USA  
One Madison Avenue, NY, NY 10010  
Phone +1 212-538-7918