

Commercial Customs Operations Advisory Committee (COAC) Government Issue Paper: Emerging Technologies

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U.S. Customs and
Border Protection



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Action Required: Informational

Background

- CBP recognizes the need to stay modern to meet the challenges of an evolving trade landscape. New actors, industries and modes of conducting business have emerged, disrupting the traditional global supply chain. To continue to effectively fulfill CBP's mission, CBP is pursuing the 21st Century Customs Framework (21CCF) initiative.
- CBP is working closely with the private sector and the Department of Homeland Security's Science and Technology Directorate (DHS S&T) to research and develop new technologies to advance trade facilitation, security, and enforcement objectives through a new age of exciting innovative products.
- CBP also aims to evolve its partnerships with trade, academia, and other federal agencies around advanced, data-centric technologies.
- CBP is exploring technologies including blockchain, augmented reality (AR), artificial intelligence (AI), machine learning (ML), and mobile technologies in an effort to find efficiencies for the supply chain.

21st Century Customs Framework

- Through 21CCF, CBP seeks to address and enhance numerous aspects of CBP's trade mission to better position the agency to operate in the 21st century trade environment
- The five pillars of 21CCF are:
 - Enhance facilitation and security through 21st century processes
 - Define customs and trade responsibilities for emerging and traditional actors
 - Ensure seamless data sharing and access
 - Employ intelligent enforcement
 - Protect and enhance customs infrastructure through secure funding
- Modern technology will serve as a cross-cutting enabler in support of all five pillars. 21CCF seeks to embrace emerging technology and increase harmonization amongst government agency process, procedures, and data requirements.

Blockchain Technology

- Blockchain is a digital ledger that provides a secure, tamperproof and permanent record of transactions. CBP believes this technology has the potential to become a major component in the supply chain for the movement of goods and facilitation of entry into the United States.
- As projects are developed to assess the application of blockchain technologies, CBP focuses on these business goals:
 - Develop a transparent supply chain from beginning to end
 - Identify legitimate actors using verifiable credentials
 - Reengineer and rethink outdated business processes
 - Adopt a team mentality to collect data directly from the source
 - Replace paper processes with digitized data
- CBP's goals for every blockchain project are to:
 - Obtain data earlier in the process
 - Enhance safety and facilitation
 - Improve reporting, targeting, and predictive analysis

- CBP has demonstrated promising results, including accelerating cargo processing, expediting communications, and supporting enhanced enforcement activity.

Artificial Intelligence/Machine Learning

- DHS is working to increase the efficiency and effectiveness of customs missions, particularly those that deal with large amounts of real-time data. Efforts to accomplish this goal include:
 - Applying unsupervised learning techniques to importation data across time series, industry sectors, and geographic regions
 - Applying supervised learning techniques to data about customs actions that had favorable and unfavorable outcomes to automatically estimate potential future actions
 - Applying sound data engineering principles to large volume customs data to make it more discoverable, usable, and describable in future use cases.

Augmented Reality

- CBP is exploring the use of AR to improve intellectual property (IP) law enforcement. AR software and headsets are used to virtually display products in 3D and provide real-time information on their legitimacy. This imagery can then be used for comparisons during intellectual property rights (IPR) exams. This enhances training of staff who conduct IPR examinations by providing access to a broader range of items than are physically available on site.

Issue

- 21CCF represents a reimagining of the entry process and seeks to expedite release decisions, improve data collection, align authorities across agencies, streamline business processes and keep pace with opportunities presented by the modern trade environment.
- CBP and DHS S&T are seeking opportunities to implement blockchain in production to streamline e-commerce and food safety and enhance import processing of commodities, such as pipeline, steel, and natural gas.

Current Status

21st Century Customs Framework

- To date, CBP has developed a comprehensive set of pain points with the current entry process, identified opportunities to improve entry data collection through a major data exercise, and brainstormed multiple concepts to modernize entry.

Blockchain Technology

- Together with the DHS S&T, CBP is working to test and deploy production-level programs using blockchain technology.
 - Under the DHS Silicon Valley Initiative Program (SVIP), CBP is pursuing pre-arrival/pre-release data for steel and pipeline commodity imports.
 - Three of the SVIP projects - food safety, natural gas imports, and e-commerce - kicked off in late September/early October 2020.
 - Following successful interoperability demonstrations on May 6 and 7, 2020, Phase 2 of the steel and pipeline project also kicked off this fall. This phase will feature a steel and pipeline “Teams” under the Emerging Technologies Working Group to get feedback.
 - Through these commodity-focused projects, CBP seeks to achieve these objectives using blockchain technology:
 - Automation of paper processes
 - Introduction of interoperable standards
 - Data receipt earlier in the process

- Increased transparency, security, and facilitation of supply chain
- Enhanced entity identification
- Increased security and facilitation

Artificial Intelligence/Machine Learning

- CBP is accelerating AI adoption to keep pace with capabilities already being developed both by trade and foreign countries.
- CBP is also working to foster agile experimentation and execution of AI/ML in customs data. The approach is to establish AI/ML workspaces/analytic labs, and engage internal, industry and academic researchers and lab analysts.
- CBP is using emerging technologies to support USMCA implementation through the creation of a chatbot. The chatbot answers general inquiries about USMCA, averaging around 50 conversations each day since its launch on June 8, 2020.

Augmented Reality

- BTID recently ran an AR test to look at the possibility of sharing a visual experience between SMEs. The test used AR technology to let users see legitimate products in a virtual space instead of in product guides, and share questions and insights with both SMEs and CBPOS at different ports.

Next Steps

21st Century Customs Framework

- Modern technology will serve as a cross-cutting enabler in support of all five pillars, and in particular for Pillar 1: Enhancing facilitation and security through 21st century processes.
 - Unified Entry Process (UEP) is a key component of this pillar.

Artificial Intelligence/Machine Learning

- CBP aims to cultivate an AI-literate workforce by hosting training sessions for non-AI/ML knowledge workers, and pairing of AI/ML researchers with business SMEs, decision-makers, and systems engineers. The goal is to develop end-to-end solutions, rather than just lab experiments.

Augmented Reality

- CBP will expand its testing of AR tools to evaluate higher complexity goods like electronics. Other potential areas of AR use include integrating with existing trade processing workflows, such as object recognition for product packaging (e.g. scanning a package's barcode while investigating the package).

Submitted by: Vincent Annunziato

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