

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

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U.S. Customs and  
Border Protection



Office of Trade/Trade Transformation Office  
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**Action Required:** Informational

**Background**

- U.S. Customs and Border Protection (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 an initiative titled "21st Century Customs Framework" (21CCF).
- CBP is working closely with the private sector and the Department of Homeland Security (DHS) 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.
- Technologies being explored by CBP include blockchain, augmented reality, artificial intelligence (AI), machine learning, and mobile technologies to aid in finding efficiencies for the supply chain.

**21<sup>st</sup> Century Customs Framework (21CCF)**

- Through 21CCF, CBP seeks to address and enhance numerous aspects of CBP's trade mission to better position the agency to operate in the 21<sup>st</sup> century trade environment
- The five main 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; and
  - Protect and enhance customs infrastructure through secure funding.
- Modern technology will serve as a cross-cutting enabler in support of all five pillars. Unified Entry Process (UEP) 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 the following business goals:
  - Develop a transparent supply chain from beginning to end;
  - Identify legitimate actors;
  - Reengineer and rethink outdated business processes;
  - Adopt a team mentality to collect data directly from the source; and
  - Replace paper processes with digitized data.
- CBP's end goals for every blockchain project are to:
  - Obtain data earlier in the process;
  - Enhance safety and facilitation; and
  - Improve reporting/targeting/predictive analysis.
- To this point, CBP has demonstrated promising results, including accelerating cargo processing, expediting communications, and supporting enhanced enforcement activity.

## **AI/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 sector, geographic regions;
  - Applying supervised learning techniques to data about customs actions which had favorable and unfavorable outcomes in order to automatically estimate potential future actions; and
  - Applying sound data engineering principles to large volume customs data in order to make it more discoverable, usable and describable in future use cases.
- CBP is also using emerging technologies to support the implementation of the United States-Mexico-Canada Agreement (USMCA).

## **Augmented Reality**

- CBP is exploring the use of augmented reality (AR) software and AR headsets to virtually display products and provide real time information on their legitimacy. This enhances the training of staff who conduct intellectual property rights examinations.

## **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 are seeking opportunities to implement blockchain in production to streamline and enhance import processing of commodities such as pipeline, steel and timber.
- In addition to blockchain, CBP is researching other technologies that could become useful to the trade community in the near future. These technologies include AI, machine learning, and augmented reality.

## **Current Status**

### **21<sup>st</sup> 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 Science and Technology Directorate (DHS S&T), CBP is working to test and deploy production-level programs utilizing blockchain technology.
  - Under the program heading of the Silicon Valley Initiative Program (SVIP), CBP is pursuing pre-arrival/pre-release data for Steel and Pipeline commodity imports.
  - Following successful interoperability demonstrations on May 6 and 7, Phase 2 of the steel and petroleum project will move forward, featuring a steel and petroleum “Teams” under the Emerging Technologies Working Group in order to get feedback.

## **AI/Machine Learning**

- The adoption of AI is being accelerated in order to keep pace with capabilities already being developed both in trade and foreign countries. CBP’s strategy for this involves:
  - Outreach to trade and foreign partners on AI/machine learning initiatives, focusing particularly on data alignment and common use cases; and
  - Priority ordering of data types and models based on synchronization and/or competition with external entities.

- CBP is also working to foster agile experimentation and execution of AI/machine learning in customs data. This is being done through establishing AI/machine learning workspaces/analytic labs and engaging internal, industry, and academic researchers and analysts in labs.
- USMCA Chatbot
  - CBP launched its first chatbot on June 8 in support of the implementation of USMCA.
  - The chatbot answers general inquiries about the USMCA, and has been averaging around 50 conversations each day.

### **Augmented Reality**

- The division recently ran a test on augmented reality to look at the possibility of sharing a visual experience between subject matter experts. The test used 3D technology to give users the ability to see legitimate products in a virtual space, instead of looking at product guides.

### **Next Steps**

#### **21<sup>st</sup> Century Customs Framework**

- Cutting-edge technology will serve as a cross-cutting enabler in support of all five pillars. In particular, for Pillar 1: Enhancing facilitation and security through 21<sup>st</sup> century processes
  - UEP is a key component of this pillar.

#### **Blockchain**

- CBP is collaborating with the DHS S&T to test and deploy production-level programs using blockchain technology.
- The use cases, which are part of the CBP and DHS Silicon Valley Initiative Program (SVIP), include food safety, natural gas imports and e-commerce.

#### **AI/Machine Learning**

- CBP aims to cultivate an AI-literate workforce through having training sessions for non-AI/machine learning knowledge workers, and pairing of AI/machine learning researchers with business subject matter experts, decision-makers, and systems engineers. The goal of this 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 uses include integrating with existing trade processing workflows and pairing with cognitive services like object recognition for product packaging.

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