U.S. Customs and Border Protection

TTO Trade Transformation Office

Global Interoperability Tech Demo Phase I Overview & Results

The global interoperability technical demonstration supported measures to secure confidential trade information storage and transmission, provide simultaneous access, validation, and record updating, and enable continuous supply chain traceability across a network of entities and locations. Global interoperability standards ensure a level playing field so that no one country or company gains an advantage. CBP's innovation efforts allow our partners to retain technology choice and open market competition. CBP's exploration into global interoperability standards proofs of concept (POC) will help inform future investments as it matures the solution.

CBP, in collaboration with the DHS S&T Directorate Silicon Valley Innovation Program (SVIP), has five current projects testing global interoperability standards in the steel, natural gas, oil, food safety, and e-commerce sectors.

- The steel project will track steel from manufacturer to import, notify CBP of an intent to import, assist with origin compliance, and improve product identification.
- The pipeline oil project will affirm free trade status regardless the number of times oil is sold.
- The natural gas project will facilitate origin determination and eliminate goods entering from prohibited countries.
- The food safety project will track perishable goods from farm to import, reduce importer waste, and allow identification of packing materials used in shipping food products.
- The e-commerce project will enhance traceability of goods bought and sold by online retailers and ensure that importers comply with CBP and other partner government agencies (PGAs) requirements.

In August of 2023, CBP conducted an initial technical demonstration of global interoperability standards, ingesting data from the three different companies participating in DHS SVIP. This test used seamless data exchanges and process modernization such as verifiable credentials (VC), decentralized identifiers (DID), and cryptography to align key goals for accomplishing the mission and meeting the challenges of an evolving trade landscape. The test ensured that CBP could receive a synthetic data JavaScript Object Notation (JSON) payload and display each of the VCs on screen in an Automated Commercial Environment (ACE) testbed. The test primarily covered the petroleum oil and steel industries. Data was received pre-arrival and married with existing ACE data for operators to assess how well the new data would integrate with legacy ACE data. The system received high-quality data earlier in the supply chain in near real-time from traditional and non-traditional actors.

RECOMMENDATION: Proceed

The Business Transformation and Innovation Division (BTID) has reviewed the comments submitted by the private sector and government entities that participated in the Global Interoperability Standard Technical Demonstration. Due to the success of the technical demonstration, I recommend that we pursue additional testing in 2024. In 2024 CBP will:

- Test the ability to verify the origin of credentials and issue credentials (CTPAT VC).
- Test the ability to transmit VC data to PGAs with three SVIP projects (natural gas, e-commerce, and food safety) that lay the foundation for an upgraded single window, including advanced testing of messaging, the ability to verify credentials from the original transmission source, and more efficient clearances.
- These tests will inform CBP's development of ACE and future trade automation software, including ACE 2.0, CBP's anticipated program to transform ACE and implement next generation business processes.

Vincent Annunziato, BTID Director

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POC Evaluation Highlights

From August 22, 2023, through August 30, 2023, CBP conducted an initial test of the global interoperability standards, allowing data to be submitted to CBP in the form of verifiable credentials. Utilizing global interoperability standards, the service providers (Mesur.io, Transmute, and Neoflow) converted standard data into credentials and sent the credentials to CBP. The test collected data much earlier in the importation process and clarified the roles of participants by co-mingling non-traditional entities with traditional entities.

Twenty-three companies participated from the steel and oil industries, representing manufacturers, carriers, brokers, shippers, and pipeline operators. The Canadian companies that participated consisted of the top 95% of oil producing companies in the world. Additionally, Mexico's top steel companies participated, as did one distributor from the largest steel manufacturing company in the world.

The tests were a technical success. CBP received over 1,000 VCs and approximately 300 VPs in the mock test environment (one VP can have multiple VCs within it). Outcomes of the test included: validation that CBP can receive VPs; validation that CBP can display information in the ACE test environment for each VC that looks as expected and was correctly mapped to the proper data element; and validation that end users could assess how global interoperability standards could improve supply chain visibility.

Nine VCs were tested: Mill Test Report, Intent to Import, Invoice (proforma, commercial, invoice), Delivery Ticket, Delivery Schedule, Multi-Modal Bill of Lading, Purchase Order, Entry Number, CTPAT (no screens)

Technical

"Only a few and extremely minor data format issues were encountered for three transmissions out of several hundred transmissions that were successfully received and processed by CBP."

"Overall, the proof of concept worked very well and met all expected goals."

"Overall, this was a very successful test for both trade and CBP, accomplishing both that areas that work today and areas that need further refinement before full production rollout."

Operations/Policy

"The system seems to have great potential the glitches were minor."

"Will be very critical to also work to incorporate Global Business Identifiers to be coupled with CTPAT/MRA VCs."

"The data was visible and was great to see the future reduction of paperwork."

"CBP had visibility on the data almost instantly."

"Utilization of this technology and incorporation of same into core CBP automated systems will have direct relevance to all trade."

"It was smooth and easy to make the inputs."

"It went so smoothly that was almost anticlimactic and belittled the amount of work and effort that led to this point."

"We were glad we could contribute and enjoyed seeing a glimpse into the meticulous demo process."

"I am excited to see where this all will take us"

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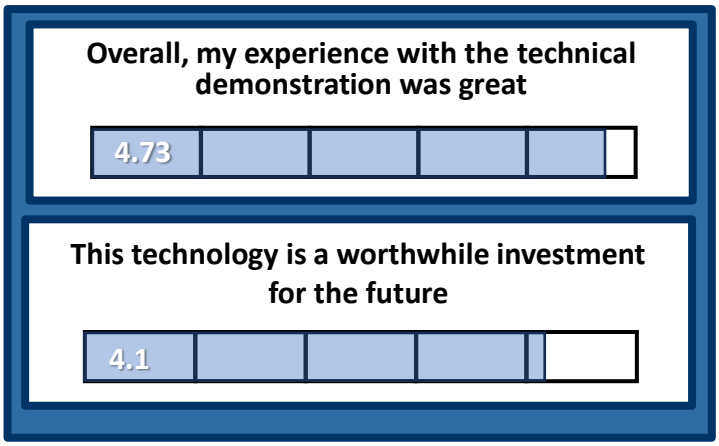
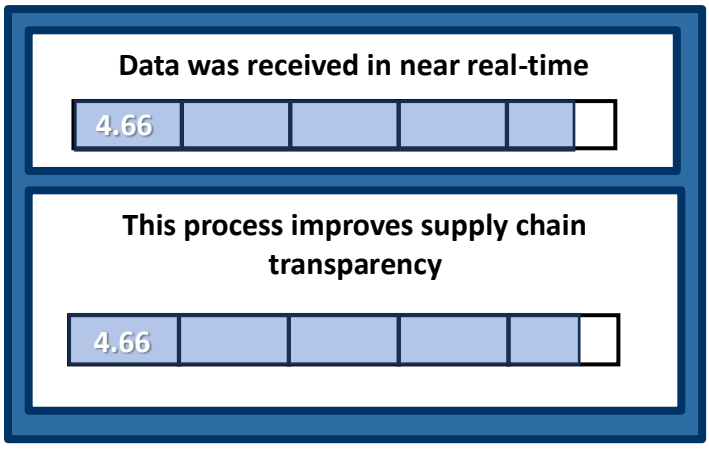
POC Evaluation Method

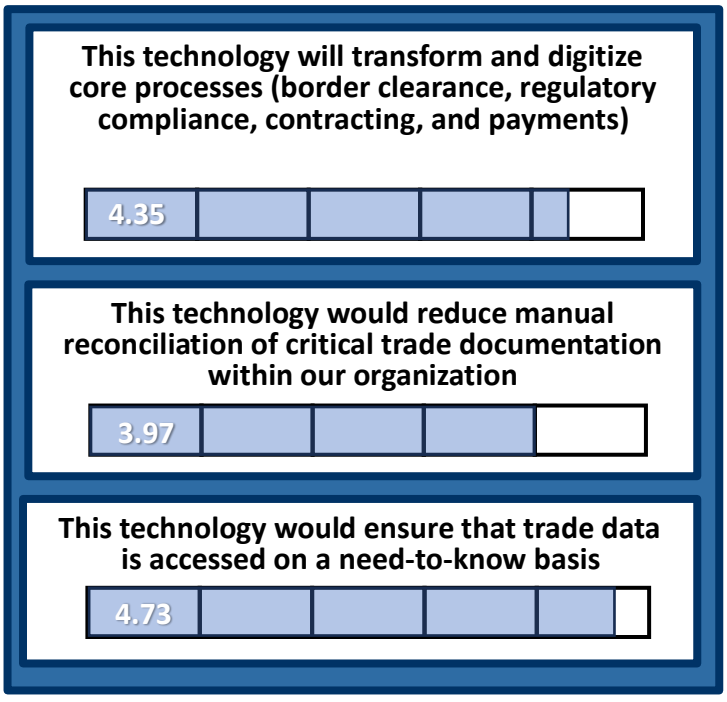
To evaluate the technical demonstration, four 1-5 Likert scale surveys were developed for each impacted area: Trade, Operational/policy, Technical, and Legal. Each survey had approximately 15 questions. The scores were tallied, developing an average of all survey respondents. Out of the 23 trade companies that participated in the test, 19 responded to the survey.

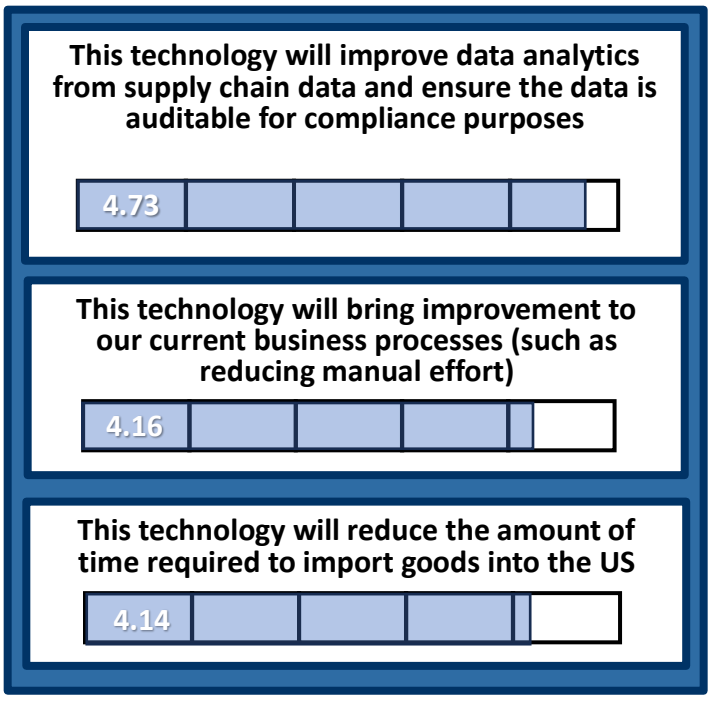
OVERALL





Trade





TECHNOLOGY

This technology can be scaled to meet the expected production volume

4.0

This technology allows a more open, cost-effective technical framework allowing trade to submit high fidelity supply chain data to CBP

4.25

The payloads were successfully received into the ACE cloud testbed

5.0

The chosen technology/standards ensure data privacy, security, integrity, unauthorized access, and tampering

5.0

The use of open standards and frameworks by ACE makes it easier for additional non-traditional actors in the supply chain to submit valuable data to CBP earlier in the importation process

4.5

OPERATIONAL

This process will reduce paperwork

4.58

VCs supplied direct from a manufacturer will assist with verifying country of origin

4.6

VCs and earlier data would permit quicker clearances of goods

4.3

This process will reduce duplication of data

4.16

The ability to view data from non-traditional actors improved my view of the supply chain

4.3

Able to determine what data/verifiable credential was supplied by each actor

4.3