CADENA
Global Interoperability Pilot

Overview & Results

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CONTEXT

The Inter-American Development Bank (IDB) is promoting the use and application of new technologies to facilitate and secure trade, and meet the challenges of an evolving commerce landscape. In doing so, the IDB in collaboration with the IDB Lab has developed and implemented the **CADENA initiative**.

CADENA is a solution that enables customs administrations and other entities to share data about firms which are compliant with security standards and customs' laws and regulations. These firms are **Authorized Economic Operators (AEOs).**

CADENA has been evolving and innovating throughout the years, while testing and validating different blockchain networks (from a private one to the **LACChain** public permissioned blockchain). It has seamlessly integrated advanced cryptographic protocols and widely recognized interoperability standards, such as **Decentralized Identifiers** (DIDs), **Verifiable Credentials** (VCs), and digital wallets.

The objective is to harness the power of decentralized technologies, in accordance with the **W3C's** digital identity standards and protocols, to forge an interoperable and scalable ecosystem. This ecosystem is designed to streamline and safeguard cross-border electronic data sharing, thereby enhancing global trade facilitation.

PILOT PROJECT

In May 2024, the IDB carried out a regional pilot project to run a technical test and demonstration of these interoperability standards and elements. The test was conducted on a testbed provided by **Extrimian**, the selected technology vendor for the design and implementation of this pilot.

The main objective was to validate the process of issuance, presentation, and verification of an AEO VC. The test consisted in seamless data exchanges amongst **Colombia National Tax and Customs Directorate (DIAN)** as the issuer of the AEO VCs, four AEO Colombian firms (**UPS, Carboquimica, Spataro and Vitalis**) as holders and presenters of the AEO VCs, and two verifiers, as the data requesters of the AEO VCs for validation (**Costa Rica Customs National Service and Colombia Ministry of Trade,** Industry and Tourism (MINCIT/ Single Window).

THE TEST WAS A SUCCESS AND IT COMPRISED THE FOLLOWING ACTIONS:

1	Based on the WCO Data model, AEO certification data was converted into a AEO VCs following the standards of W3C.
2	Each of the entities participating in the test, through a digital mobile or web wallet, was able to obtain and share its unique decentralized identifier (DID). It was then linked to the AEO VCs providing traceability and visibility of their digital identity throughout the operation.
3	Colombia Tax and Customs Directorate (DIAN) issued AEO VCs to the digital identity (DID) of each AEO Colombian firms and owners, which received them in real time in their digital mobile or web wallets, becoming holders and owners of the AEO VCs.
4	AEO Colombian firms presented the AEO VCs through their digital wallets to Costa Rica Custom National Service and to the Colombian Ministry of Trade (MINCIT)/Single Window for verification. Both entities were able to verify in their portals testbed the validity of the AEO VCs and the authenticity of the identity of the issuer and holder/presenter through their digital identity (DIDs) in real time.
5	Several additional trials were made to modify the status from ¨Active¨ to ¨Canceled¨ of the AEO VCs by the Colombian Tax and Customs Directorate (DIAN), as the issuer, in order to validate that the verifiers via the AEO firms as presenters were receiving updates of the data in real time.
6	A hash of each AEO VC issued and DID generated was registered in the LACChain blockchain network which acted as a Trust Registry providing a security layer of the transactions.

For a visual demonstration of the pilot, watch this video.

PILOT PROJECT ASSESSMENT AND FINDINGS

The test enabled continuous AEO identity and status data visibility and traceability in real time across a network of entities and locations across the region, and specifically allowed to validate the following actions:

1	To secure confidential trade information (AEO data) storage and transmission.
2	To provide simultaneous access from issuer, holders, and verifiers.
3	To update records of AEO VCs by the issuer and the holder (such as its validity and the contract data of the holder).
4	To ensure that the verifiers could receive a synthetic data JavaScript Object Notation (JSON) payload, and display in real time each of the AEO VCs on a screen in their automated portal testbed.
5	To guarantee a level playing field as these standards allow data interoperability while decoupling it from the use of a specific and unique technological system to share data by all the actors or entities in the ecosystem.
6	To prove interoperability without requiring all actors or entities having a node in the blockchain network, as it is the case for the four AEO firms and for one of the verifiers (the Ministry of Trade of Colombia (MINCIT)).

THE TEST ALSO VALIDATED THE POTENTIAL OF THE INTEROPERABILITY ELEMENTS FOR OTHER USE CASES, AS THEY:

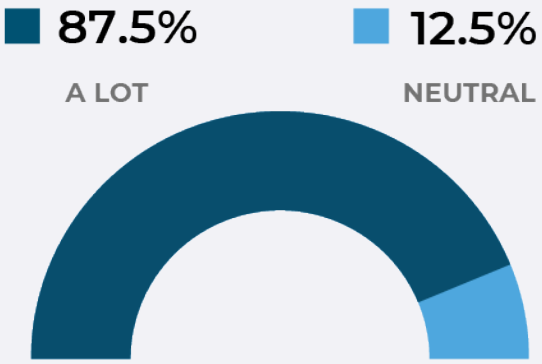
- **Ensure scalability,** since this technology is easily accessible to both private and public entities. Additionally, various data and trade and transport documents, such as certificates of origin, commercial invoices, letters of credit and bills of lading, can be converted into VCs.
- Empower end users to directly evaluate the **impact of interoperability standards** on enhancing supply chain visibility, traceability, time efficiency, and the reduction of paperwork in trade operations globally.

PILOT PROJECT EVALUATION METHOD

To evaluate the technical test during the pilot project, a survey was developed including questions related to: knowledge of the technology, usability and user experience, relevance and innovation, impact on foreign trade, and benefits. The scores were tallied, developing an average of all survey respondents.

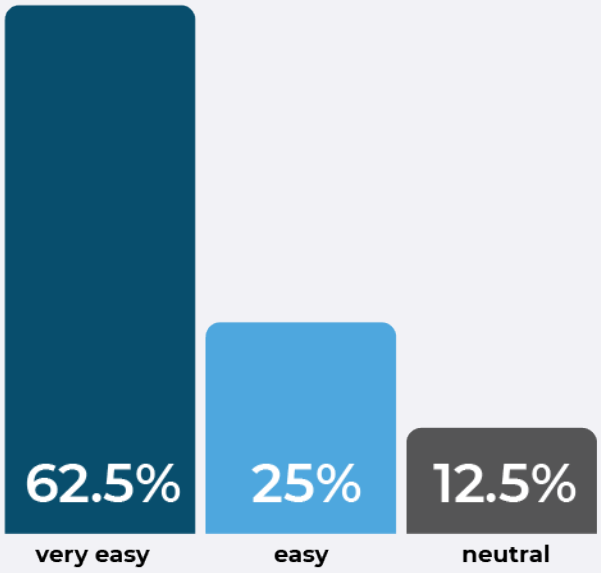
KNOWLEDGE OF THE TECHNOLOGY

Do you think that after participating in this initiative your understanding of Digital Identity through Decentralized Identifiers (DID), Verifiable Credentials (CVs), and digital wallets has improved?



USABILITY / USER EXPERIENCE

Rate how easy it was to use the tools provided during the validation for the issuance, reception, presentation and validation of the Verifiable Credentials (VCs) through the digital and web Wallet.



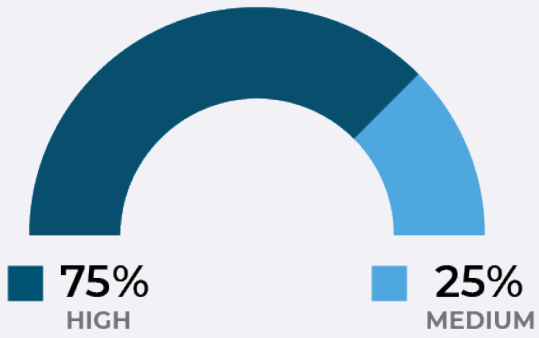
RELEVANCE AND INNOVATION

What characteristics do you consider most important of a Verifiable Credential according to what was exposed during the sessions?

100%	It improves interoperability and exchange of information between foreign trade actors.
87.5%	It provides reliability of the data that is part of the Verifiable Credential.
62.5%	It confers a high degree of information security and data privacy.
62.5%	It enables a high degree of automation and digitization of the certification issuing process.
75%	It provides 24/7 availability of the AEO VC to be presented by the owner for verification.

IMPACT ON FOREIGN TRADE

What do you think would be the level of positive impact of the use of Verifiable Credentials in the foreign trade activities in which your organization/company participates?



BENEFITS

What do you think would be the main benefits you would get from using this or another solution based on decentralized digital identity (DIDs and Verifiable Credentials)? (Select all that apply)

75%	To facilitate the level of compliance in foreign trade regulatory processes.
75%	Greater capacity to reduce time and costs in foreign trade processes.
100%	Greater reliability in data to validate foreign trade processes.
75%	To increase visibility, traceability of information and foreign trade procedures.
100%	To increase the ability to interoperate and eliminate duplicate processes between government agencies.
75%	To improve services provided by foreign trade entities and greater transparency.

This pilot project is aligned with other innovative global initiatives conducted in the USA by **CBP and DHS S&T Directorate Silicon Valley Innovation Program (SVIP)**, in the European Union by the European Commission under the Digital Europe Programme via the **CIRPASS** initiative, and in Singapore by the Infocomm Media Development Authority (IMDA) via the **TradeTrust platform**. The pilot is also aligned with the **E-data Verifiable Credentials for Cross Border Trade** White Paper by UN/CEFACT etc.

For information about the initiative, you can contact:

Sandra Corcuera Santamaría (sandracs@iadb.org)
Michelle Moreno (michellem@iadb.org)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