



Brussels, 08 September 2023.

Digital Customs

Outline of a concept paper on the use of blockchain by Customs

(Item VI on the Agenda)

SUMMARY

Purpose of document

Blockchain technology offers features that help make the flow of information in supply chain processes reliable, secure and trusted. Considering the potential benefits of blockchain features for cross-border trade and digitalization procedures, together with the obstacles in adopting this technology, a concept paper on blockchain is being proposed to help untangle and simplify blockchain's complexity and justify the cost of blockchain implementation, bearing in mind the identified benefits. The concept paper will serve as a reference guide for Customs administrations when considering adopting blockchain technology.

The Permanent Technical Committee (PTC) will be invited to discuss key topics and a draft outline/key topics of a concept paper on the use of blockchain by Customs, as well as the role of Customs in a blockchain-enabled environment.

Action required of the PTC

The PTC is invited to:

- provide input and discuss the outline/key topics covered by the concept paper as described in this document; and
- invite interested experts from Member administrations or observer organizations to contribute to the development of the concept paper during the intersession.

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I. Background

1. The WCO Strategic Plan¹ 2022-2025 includes Technology and Innovation as one of its focus areas (FA1). This focus area aims to reduce the digital gap between Members and initiate concrete steps towards the full digitalization of procedures, data analytics and the exchange of information in a dematerialized way. FA1 highlights the need for harmonized and comprehensive approaches, preventing the proliferation of activities developed in isolation and responding to the needs of Customs, other agencies and the entire supply chain.
2. Digitalization of Customs procedures is a key component of border modernization as it enhances cross-border trade efficiency and ensures effective Customs control. Digitalization enables Customs to use electronic information and utilize automated clearance, risk management and targeting processes. In particular, Customs risk management capabilities allow Customs to determine their level of intervention based on a shipment's risk profile.
3. Digitalization is a journey of continuous improvements. Digitalization improvements may include increasing data quality, simplifying processes, improving interoperability between relevant parties and systems, reducing and eliminating manual processes, bridging digital gaps, addressing fraud, increasing cybersecurity, and complying with legal requirements such as data protection and privacy policies.
4. New technological developments often contribute to improving the digitalization of Customs procedures. In particular, it has been claimed that blockchain can revolutionize cross-border trade processes and regulatory procedures. Some of the key blockchain features and their benefits for cross-border trade processes and regulatory procedures are described in the table below.

Features	Benefits
Transparency	<ul style="list-style-type: none"> • level playing field; • increased integrity.
Distributed network architecture	<ul style="list-style-type: none"> • connecting different supply chain stakeholders; • eliminating redundant intermediaries; • removing the need for a single point of failure; • removing the need for a centralized platform/hub.
Immutability	<ul style="list-style-type: none"> • ensuring the authenticity of trade data/documents; • providing single version of truth; • increasing trust in using electronic information; • improving data quality; • preventing fraud (e.g. data tampering); • enabling an audit trail.

5. The WCO Study Report on Disruptive Technologies lists blockchain technology as one of the technologies studied and indicates a certain level of interest by Customs administrations in adopting the technology. Some 35% of 110 respondents reported different statuses of blockchain implementation (i.e. proof of concept, pilot and full deployment). The Study Report also describes some obstacles in adopting blockchain,

¹ https://www.wcoomd.org/-/media/wco/public/global/pdf/about-us/administrative-documents/strategic-plan-2022_2025.pdf?db=web

including lack of expertise (demonstrating that blockchain is considered a complex technology) and costs (indicating that blockchain-based solutions are more expensive than conventional digitalization solutions).

II. Concept paper on the use of blockchain by Customs

6. Considering the potential benefits of blockchain features for cross-border trade and digitalization of procedures, as well as the obstacles in adopting the technology, a concept paper on blockchain is proposed to help untangle and simplify blockchain's complexity and justify the cost of blockchain implementation in view of the identified benefits. The concept paper will serve as a reference guide for Customs administrations when considering adopting this technology, among others. It will help identify the use case of blockchain adoption, the added value of blockchain for the selected use case, and whether the implementation cost can be justified; other stakeholders potentially involved in blockchain and their roles; governance (including data governance) model; processes and services implemented on top of the blockchain solution; data clusters; and the most suitable blockchain technology.
7. In line with the principles laid down in the WCO Strategic Plan, where every initiative should be carried out in harmony with other and prior initiatives, the concept note will look into how blockchain is relevant to existing WCO instruments and tools, such as the Single Window Compendium, Globally Networked Customs (GNC), Coordinated Border Management (CBM), the WCO Data Model, and the E-Commerce Framework of Standards.
8. The concept paper will address the following key topics, among others.

II.a. Ecosystem

9. The blockchain ecosystem determines the scope of the blockchain based digitalization. The ecosystem will also determine the type of entities and their roles, the processes and services, purposes and benefits, and the kind of data/information used within the ecosystem.
10. Three elementary ecosystems will be considered, namely Single Window (Government to Government, including Business to Government (B2G2G) at the national level), cross-border interconnectivity (G2G at the international level), and supply chain interconnectivity between traders and regulatory agencies (B2B2G). These three elementary ecosystems are used to simplify the blockchain implementation concept. In practice, a combined ecosystem may be implemented.
11. Existing instruments and tools will be examined to describe each ecosystem. These instruments and tools include the Single Window Compendium (for the national B2G2G ecosystem) and the GNC Handbook (for the international G2G ecosystem). The supply chain interconnectivity ecosystem (B2B2G) is relatively new territory for the WCO as the ecosystem contains B2B processes which are usually out of the WCO's scope of work as an intergovernmental organization. Standard 1² of the WCO Framework of Standards on Cross-Border E-Commerce addresses this topic to some degree.

² Standard 1 of the WCO Framework of Standards on Cross-Border Ecommerce: "...the requirements of advance electronic exchange of data between relevant parties involved in the E-Commerce supply chain, and Customs administrations and other relevant government agencies to enhance facilitation and control measures."

II.b. Benefits

12. Blockchain adds a new layer to digitalization, which translates into additional costs. It is therefore crucial to identify and understand the benefits of blockchain features in order to justify the cost and determine whether or not blockchain is urgently required. Blockchain may offer different levels of benefits within other types of ecosystems. For example, a blockchain-distributed network architecture may provide essential benefits for a supply chain interconnectivity, but may not provide tangible benefits for a single environment, noting that establishing a centralized Single Window platform/portal with the necessary redundancy (backup systems) is generally considered manageable at the national level.

II.c. Processes/services

13. The concept paper will examine and describe the processes and services related to the blockchain ecosystem. In a Single Window ecosystem, the processes are based on Single Window service design, including border clearance, permits, licensing and certification. In a cross-border interconnectivity ecosystem, the process is unique to individual "Utility Block" designs as described in its business rules and trigger layer. Accordingly, the UNCEFACT Buy Ship Pay model could be used to explain the supply chain interconnectivity ecosystem process. The processes/services determine the type of data stored/referenced in the blockchain and describe the interaction between the parties involved.

II.d. Entities

14. The blockchain network serves as an ecosystem for direct/indirect collaboration between entities involved in the ecosystem. Understanding the blockchain entities, their roles in the ecosystem, the processes they undertake and the services they provide is crucial to help establish collaborative arrangements. Typically, each entity presents a unique interest and objective within the ecosystem. A collaborative arrangement requires the identification and mutual understanding of the common interests and objectives of all the parties involved.

II.e. Governance

15. As part of a multi-stakeholder digitalization platform, a sound governance mechanism must be established to enable an transparent and inclusive consultative and decision-making process that shapes and steers how the blockchain ecosystem will operate. The concept note will address different options for the governance model for each blockchain ecosystem.

II.f. Data and data governance

16. The block in the blockchain is the storage of assets (on-chain) or their representation (off-chain). In the context of the digitalization of cross-border trade processes/procedures, the blockchain asset is the supply chain data or its metadata. In the context of supply chain digitalization, blockchain aims to facilitate seamless information flow within a certain process or between different processes. Therefore, defining datasets used in blockchain-related processes is necessary.
17. Every node in a blockchain network contains a copy of the blockchain, which implies that each node has access to the blockchain. However, not every entity in the ecosystem can access all or part of the data. Access to the blockchain does not necessarily mean access to its underlying data. An appropriate data governance mechanism should be established to, inter alia, govern data access, purposes of data use, data standardization and data protection.

II.g. Interoperability

18. A blockchain ecosystem is an arena for interaction between different digital systems and potentially between a blockchain ecosystem and another ecosystem. Such interaction requires each component in the ecosystem to be interoperable with one another. The concept paper will examine possible interoperability scenarios and solutions at different levels, including at the blockchain (inter-chain), semantic (data definition) and syntax (data format) levels.

II.h. Blockchain nodes

19. Blockchain nodes are critical to the blockchain ecosystem as they ensure blockchain transaction validity. The actual value of blockchain is multi-stakeholder transaction validation. Therefore, it may not make sense to build a blockchain ecosystem only with one node, or more nodes operated by a single entity, as the blockchain transaction validity will be compromised. The concept paper will address the type of entities' participation in a blockchain ecosystem, either as an operator of different kinds of blockchain node or as a passive participant (i.e. data consumer).

III. Way forward

20. The concept paper will be developed during the intersession and then submitted to the PTC at its Meeting in April 2024 for its consideration. Interested experts from Member administrations or observer organizations are invited to contribute to the work by joining a Mini Group meeting to be held virtually during the intersession.

IV. Action required of the PTC

21. The PTC is invited to:
 - provide input and discuss the outline/key topics covered by the concept paper as described in this document;
 - invite interested experts from Member administrations or observer organizations to contribute to the development of the concept paper during the intersession.
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