

# Digitalising trade with blockchain

## The Certificate of Origin

March 2021

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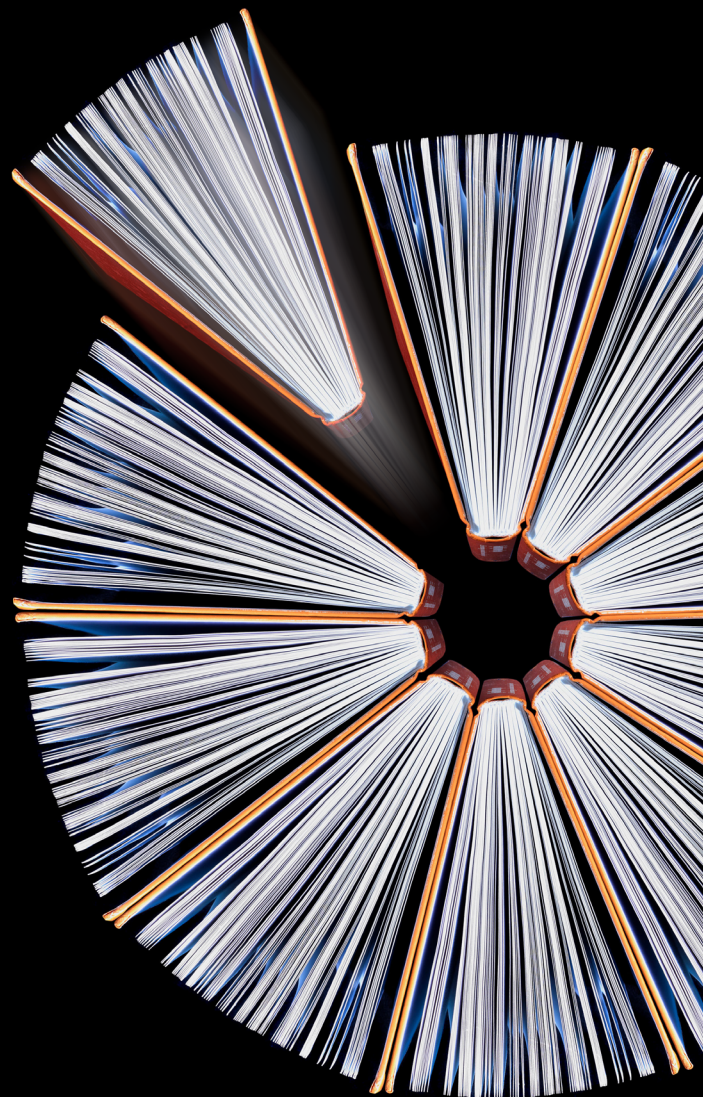
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# Abstract

This paper analyses the initial use case that lead to the development of the pilot project to enable a fully digital supply chain for the issuance, transfer and verification of the Certificates of Origin (CoO). This pilot project is an example of how international trade documents can be digitalised and secured through the use of Blockchain technology and how this application can be expanded to other trade documents.

In the spring of 2020, the Belgian maritime technology startup T-Mining - with the support of Deloitte and the Belgian Federation of Chambers of Commerce - embarked on an ambitious international project to pilot a blockchain-based solution to create and transfer authentic, digital CoO between trade partners and authorities. The initial requirements gathering resulted in the development of a Minimal Viable Product (MVP) by the end of 2020, which is now ready to be field-tested in two planned pilots.

For 2021 the project partners - with funding from the Flemish government (VLAIO) - are looking for companies who export goods from Europe to other parts of the world, and who are interested in joining the two planned international pilots. The goal of the pilot is to use the solution, which is connected to the digital CoO issuing platform of the Belgian Federation of Chambers of Commerce, in a selected trade lane with trade partners, to transfer CoO's fully digital between trade partners and authorities, and measure the gains in efficiency and the reduction in errors and waiting time.



# Current trade times

Global trade documentation, such as bill of lading, invoice, packing list, CMR document, Certificate of Origin (CoO), letter of credit etc. and the accurate completion thereof are essential to the successful importing and exporting of goods. Global flows of goods are not possible without global flows of information that are attached to those documents. Such information is provided and exchanged in paper or electronic form. However, paper-based processes still prevail in foreign trade transactions due to complicated business processes and lack of acceptance of electronic forms from customs authorities.

These trade documents and the data elements contained therein are defined and prescribed by national and international regulatory requirements in fields such as health, consumer protection, safety, tax and revenue, trade policy, environment and security.

Especially against the backdrop of the COVID-19 pandemic, where authorities increasingly accept digital copies of documents as main official documents and remote work has become the 'new normal', questions arise as to how the authenticity, correctness and completeness of these documents will be assessed.

This paper describes the importance and challenges underlying a particular trade document, the Certificate of Origin ("CoO"), as one of the key international trade documents certifying that a commodity or good in fact originates from a particular country.<sup>1</sup> The CoO can be described as the passport of the goods that indicates their nationality. We will showcase how the end-to-end process from issuing to verifying a CoO can be digitalised through a live pilot project in collaboration with economic operators, Chambers of Commerce and customs authorities (hereafter "customs"), and enabled and secured by using Blockchain technology.

<sup>1</sup> International Chamber of Commerce, Certificates of Origin, available at: <https://iccwbo.org/resources-for-business/certificates-of-origin/>





# The non-preferential origin

Non-preferential rules of origin are used to determine the country of origin of goods for the application of the Most-Favoured Nation treatment (“MFN”) but also for the implementation of a number of commercial policy measures such as anti-dumping and countervailing duties, trade embargoes, safeguard measures and quantitative restrictions or tariff quotas. They are also used for trade statistics, public tenders and origin marking. The origin of the goods is determined by getting the CoO of the country where it was wholly obtained from or where it underwent the last significant transformation. If only one country is involved in producing a good the wholly obtained concept will be applied. Moreover, the non-preferential rules of origin are determined by national legislation, there is no uniform set of rules globally.

In practice this will mostly be restricted to products obtained in their natural state and products derived from wholly obtained products. If two or more countries are involved in the production of goods, the concept of last, substantial transformation determines the origin of the goods.<sup>2</sup>

Proof of origin is all evidence submitted to support the declared origin, the non-preferential CoO is used for that purpose as described below.

The CoO certifies that goods are wholly obtained, produced, manufactured or processed in a particular country. It declares the ‘nationality’ of the product and serves as a statement by the exporter and

importer to satisfy customs and/or trade requirements. It is an official administration document stating the product’s country of origin. As mentioned above, the non-preferential CoO is important for the application of any quota and for the application of anti-dumping rights. It is also important if an indication of origin was introduced to the product or its packaging as well as if any political measures are taken i.e. embargoes or boycotts.

Typically it is issued by Chambers of Commerce upon the request of the exporter, sometimes it is issued by customs or other authorised institutions appointed by the government.

<sup>2</sup> [https://ec.europa.eu/taxation\\_customs/business/calculation-customs-duties/rules-origin/nonpreferential-origin\\_en](https://ec.europa.eu/taxation_customs/business/calculation-customs-duties/rules-origin/nonpreferential-origin_en)







### Current challenges of non-preferential CoO

Currently there is no harmonised procedure across the world for the issuance of CoOs by Chamber of Commerce. The International Chamber of Commerce (“ICC”) has established a universal set of digital procedures for issuing and attesting CoOs by Chambers. Some of them already issue electronic CoOs, however authentication,

authorisation and privacy often remain a challenge for CoO documentation. We see some progress in the digitalisation of the CoO process request with some Chambers of Commerce that made available to their economic operators a platform to connect their ERP in order to request and receive directly the CoOs in their systems. Nevertheless, we observe some limitations as described in the below graph.

The following graph demonstrates an export flow from a European Union (EU) country (Belgium), to a South-East Asian country (Singapore) where a non-preferential CoO is requested.



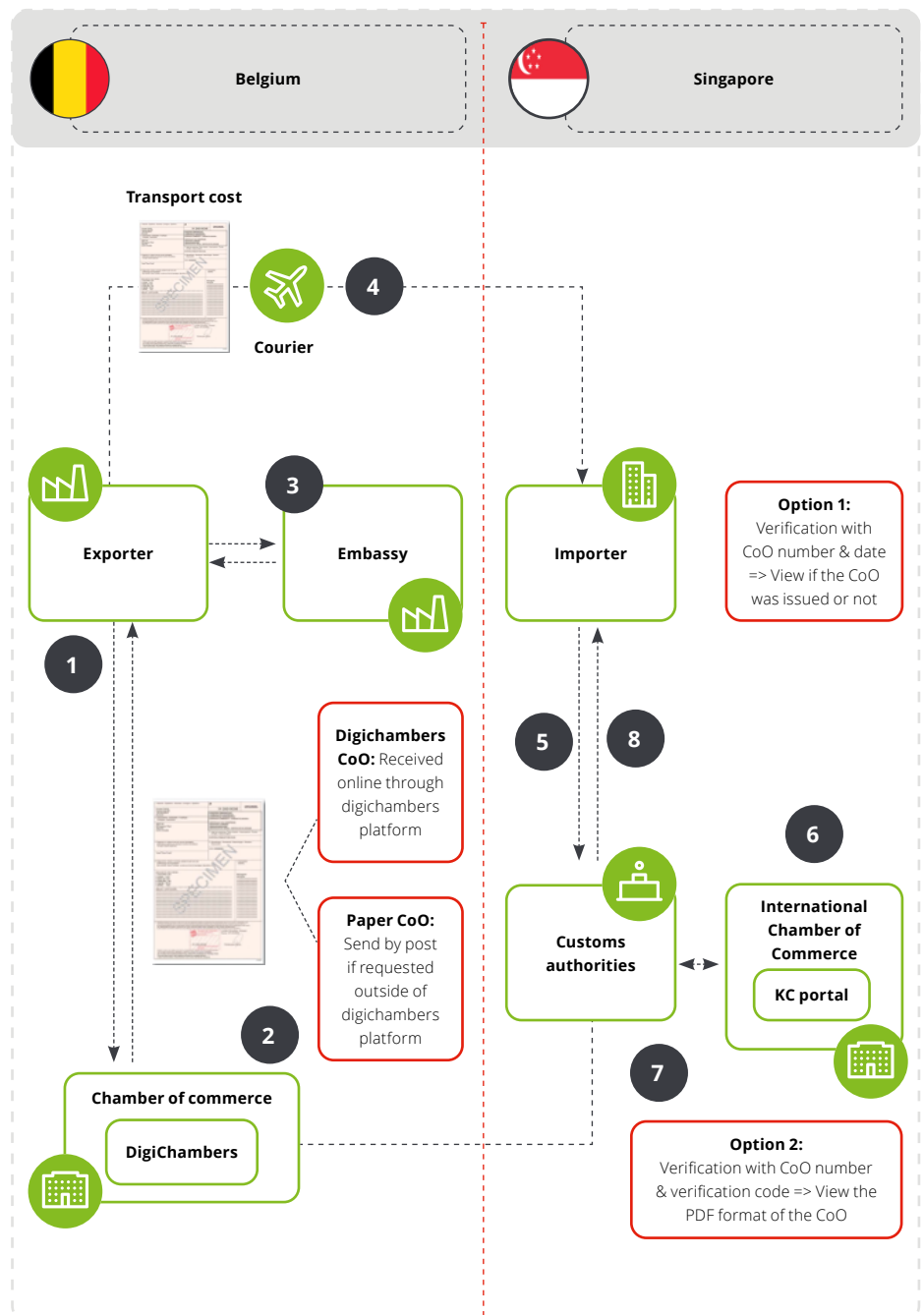
<sup>2</sup> World Customs Organisation. (June 2018). “Guidelines on certification of origin”



### Non-preferential CoO request for an export from Belgium to Singapore

The current process of applying, issuing, receiving and verifying a CoO can be summarised as follows:

1. In essence, the exporter applies for a CoO through the Chamber of Commerce and in this case by using digichambers, the online platform made available by the Belgian Chamber of Commerce for its members. The possibility to apply through the chamber without using the online portal is still available;
2. Typically, the exporter receives the certificate either by email or by post and then prints it in-house. Depending on the option chosen, the cost and lead time differ;
3. Sometimes the exporter needs to legalise the CoO at their respective embassy and get a physical stamp on it. Hence, additional costs are incurred for that purpose;
4. The CoO is then transferred by courier and sent to the importer or the customs broker;
5. The importer or the customs broker presents the CoO to customs in order to verify its authenticity.
6. The ICC has put in place a portal<sup>3</sup> to help the customs authorities to verify whether or not the CoO has been issued.
7. The customs authorities also have the option to view the actual certificate in PDF format, in this case through digichambers;
8. Lastly, the document is archived at the importer and often a copy is kept by the exporter.



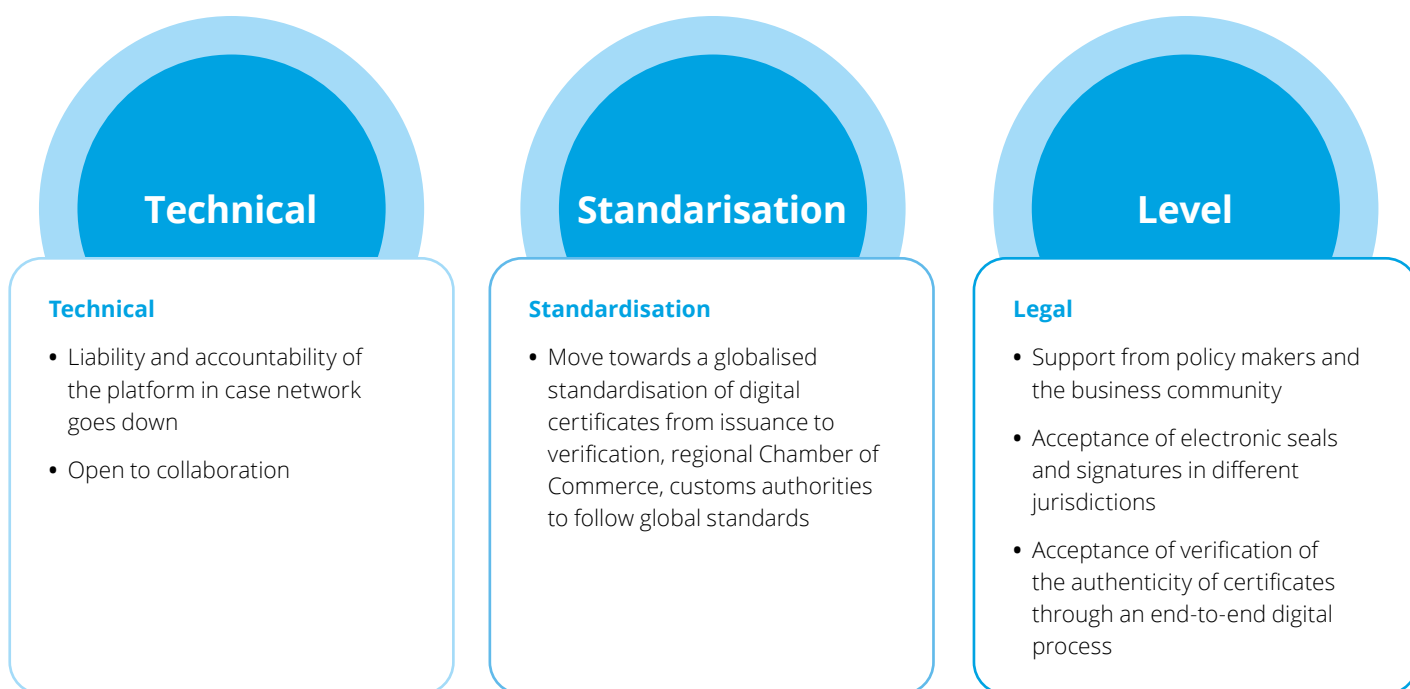
### Current state of the process and identified opportunities

An observation of the aforementioned example flow supports the conclusion that the use of manual processes is cumbersome, tedious and often leads to massive backlogs in the issuance of CoOs. The specific existing examples use 'digital' certificates, yet subject to some limitations. The example flow presented above shows the current process works, from applying to issuing and verifying a CoO. The possibility to apply and submit the required documentation online and receive it by email can already decrease delivery time to fewer business days, leading to a decrease of costs and time for the exporter and the issuing body.

Nevertheless, there are still important disadvantages attached thereto, as digitalisation is not end-to-end and still requires an important degree of manual effort. Half of the process remains paper-based, arguably due to the fact that trusting a digital format as the sole source of truth is not an established standard. The process can still be costly as the certificate needs to be sent by courier or authentic duplicates are often requested. Therefore the risk of manual errors that can lead to goods blocked at the border or non-compliance persists and the overall process can be delayed. Storing and archiving the documents is also very time-consuming and can lead to high stress for companies in case of audits.

This is where we identify major opportunities to fully digitise the issuance and verification process of a CoO by using Blockchain technology as an enabler to create trust between the parties involved. The objective is to connect the existing platforms of Chambers of Commerce and the customs authorities, and to help all the stakeholders in the supply chain to benefit from it.

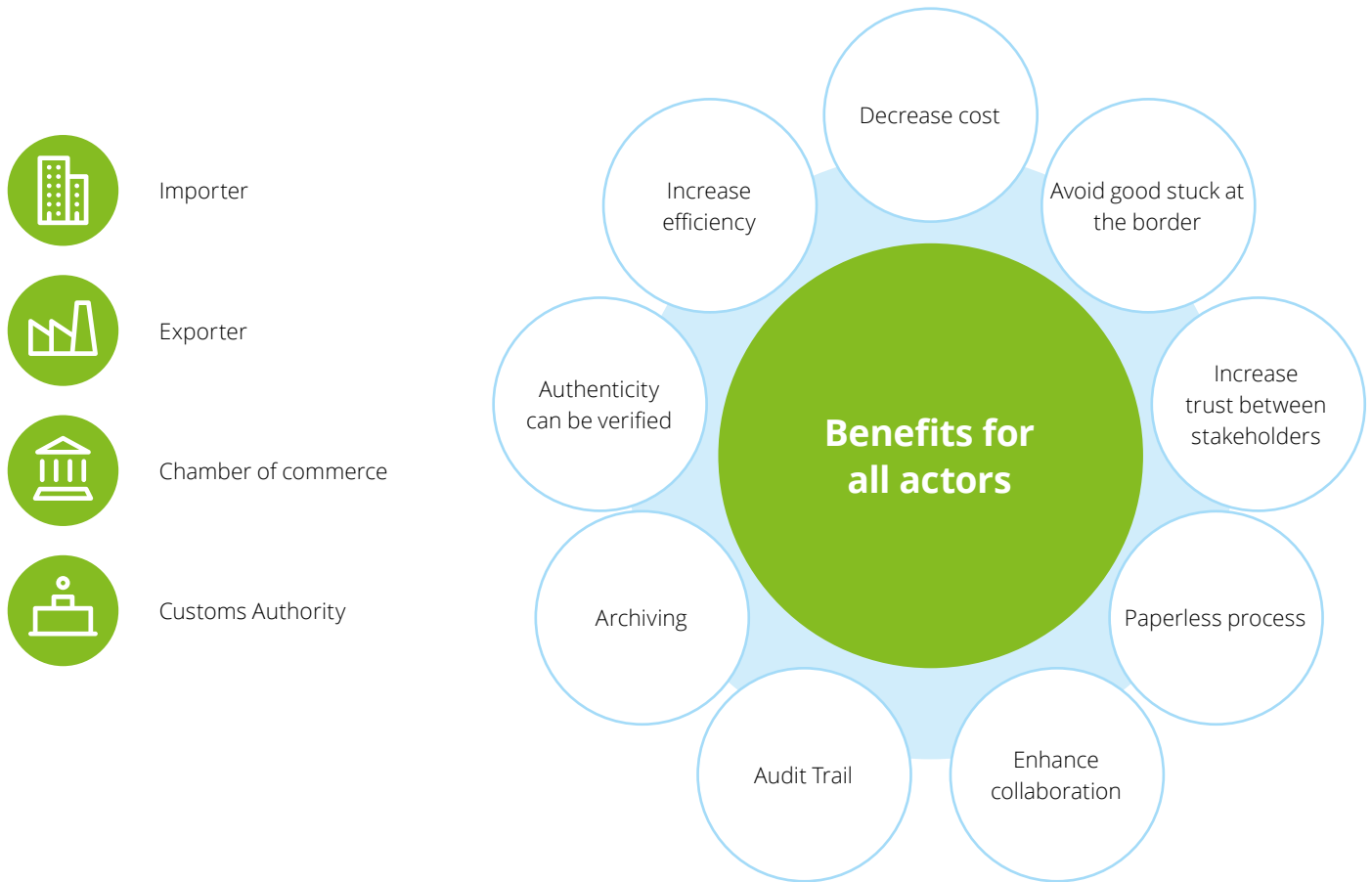
We of course need to take into account a number of **considerations** that are not a show stopper, such as:



The current considerations can be addressed and solved by enabling Blockchain technology within the existing process. We are not presenting a change of systems but a use of Blockchain technology to connect the different platforms in order to apply, issue, transfer and verify CoOs.

<sup>3</sup> International Chamber of Commerce. (2020). "[Certificate of origin verification website](#)"

There are benefits for all actors in the supply chain: importer, exporter, as well as the Chambers of Commerce and the customs authorities.



We can highlight the key benefits of leveraging Blockchain technology to empower a fully end-to-end digital process:



Costs can be decreased in the transport and verification process of the CoO;



Having the correct documentation in place will avoid goods being stuck at the border;



Trust between stakeholders, including between Chambers of Commerce and customs authorities of different countries will increase;



Archiving will be improved and the authenticity of the information will be verified in almost real time.

# End-to-end digital process

Digitalisation of trade documents is not a new phenomenon. Nevertheless, limitations as described in the previous section slow down the adoption of an end-to-end digital process. In the following section, we describe the key contribution of Blockchain technology and the way we could expand this case study to more trade documents which multiple stakeholders need to receive and authenticate.



### Understanding what Blockchain technology can do

Blockchain technology is in essence a data-sharing technology. Data in its broader sense can also carry value and identity. This data can be shared in a secure, authentic way between peers in a network that does not rely on centralised authorities, thereby ensuring that the data obtained by users has not been tampered with. This distributed verification method promotes data integrity and transparency, dubbing the technology as an enabler of “trustless trust,” meaning that parties don’t need to know or trust each other to participate in exchanges of value with absolute assurance and reputable intermediaries.<sup>4</sup> Blockchain technology also does not have a central point of failure because all participants will have a copy of the ledger, making it more durable than a centralised system. This makes the technology very suitable for

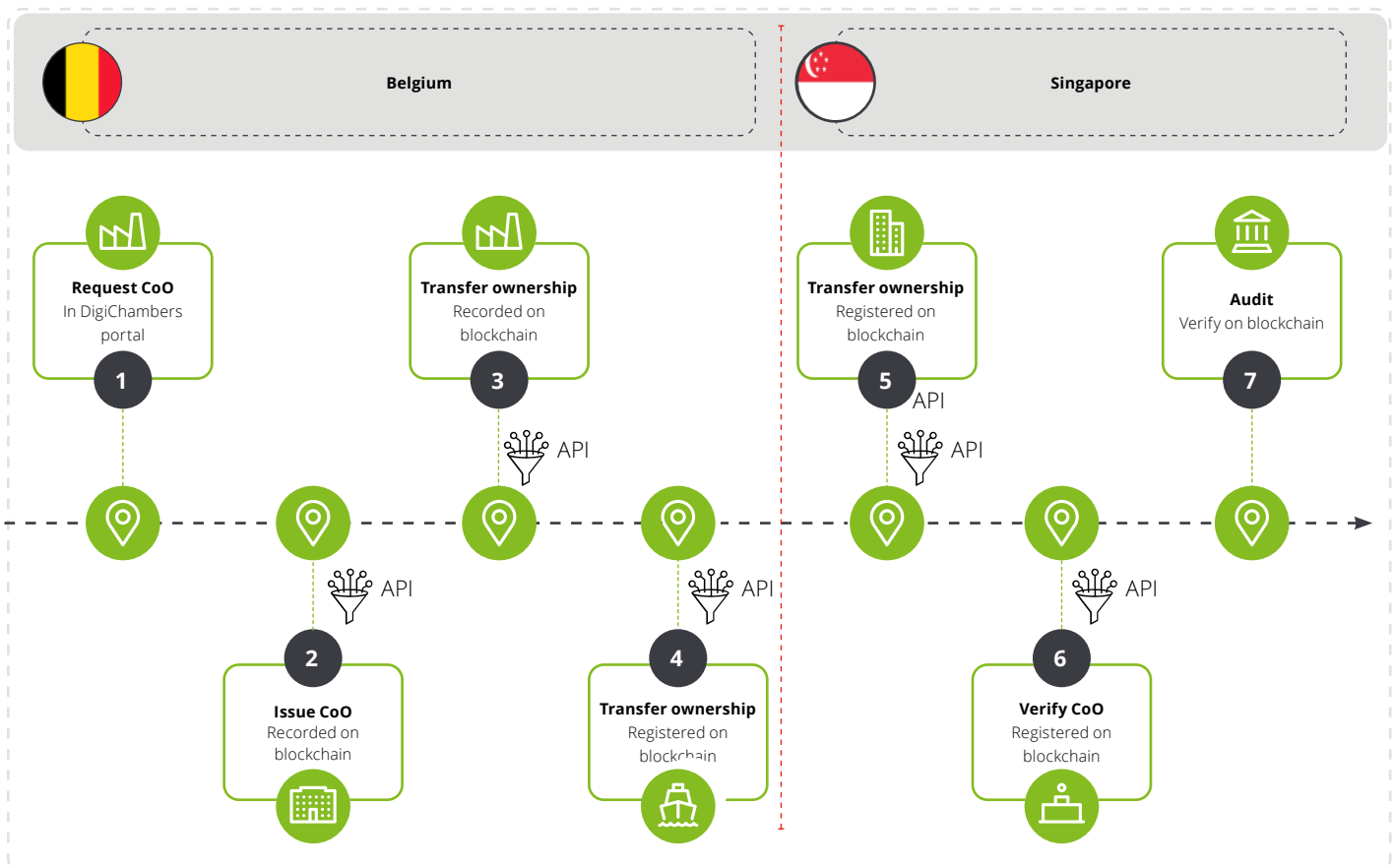
the CoO context to support the sharing of authentic, digital CoOs between the different platforms that companies employ to issue, process, and use these documents.

### Transfer of document ownership guarantees the authenticity

One of the key features of Blockchain technology is the possibility to transfer ownership of a digital asset without the need for a central authority keep ownership records. The simplest example is a cryptocurrency such as Bitcoin. Making a payment with Bitcoin entails transfer of ownership of the coin to another user of the network. A defining property of a coin is that, at any given time, only one user can own a given coin. There is no way to ‘duplicate’ a Bitcoin, as opposed to any other digital assets such as a PDF document. This is called the ‘double-spend’ problem. A digital asset such as a coin can only be spent once.

The same principle applies to digital documents once they are registered in the Blockchain – the documents can be transferred to another user of the network. Since Blockchain resolves the double-spend problem, the system can guarantee that only one copy of the document exists at any given point in time, and that it is owned by a given user. This property automatically guarantees the authenticity of the document as an immutable trail of ownership and ensures that transfer of ownership can be verified.

Specifically for documents that represent a title of ownership (e.g. the Bill of Lading) this is an essential feature. In our case of the CoO, the Blockchain network can guarantee authenticity in the same way as the customs authorities currently requires authentic paper documents to be produced.



### Scope of the solution

<sup>4</sup> <https://www2.deloitte.com/us/en/pages/operations/articles/blockchain-supply-chain-innovation.html>

### It is not about certificates anymore

The CoO is only one example. However, any type of paper certificate is a (presumed) authentic document, issued by a known authority, to 'certify' a state of affairs. For instance, a diploma is an authentic document, issued by an educational institution to certify that a given person has successfully completed a particular course or training.

When an employer requests to see the diploma during a job interview, they are not interested in knowing whether a certain piece of paper exists, but want proof of the underlying fact that the candidate has indeed completed the required training. The paper only exists to certify that fact.

Once the Blockchain network is in place, and known actors on the network trust it to share data, new possibilities arise. The customs agent requesting an authentic paper CoO is not concerned about the actual paper either. They want to know the actual origin of the good. The CoO is only a paper that certifies, by the authority of the issuing body such as the Chamber of Commerce, the real-life fact of the origin of the good.

What would happen if instead of storing a PDF copy of the current certificate in the Blockchain network to warrant its authenticity, we stored the actual information on the origin of the good? Since Blockchain technology can guarantee identification of the user that added the information in the system – in our case the issuing body such as the Chambers of Commerce – and can guarantee no one has tampered with the data, the entire concept of a certificate can be eliminated, and the actual authentic data of the origin of the goods can be shared per se.

Blockchain technology can still not guarantee the correctness of the data and the confidentiality of the users amongst the other stakeholders. It can only state who added the data and confirm that the data has not been tampered with along the way. Similarly, however, neither can paper CoOs.

### Merging the three flows

Any logistical process consists of three separate flows: the goods flow, the paper flow, and the financial flow. These run in parallel and need constant alignment. The goods can only leave the port if certain documents are available and verified to be authentic. Certain payments are only made when the arrival of the products in good condition have been verified and confirmed in a document or certificate. Usually, the documents simply exist to confirm what has happened in the 'real world' so that financial transactions linked to the flow of the goods can be executed with confidence. Considerable time and energy (up to 50% of the costs of shipping goods according to some studies<sup>5</sup>) is spent on paperwork and alignment of these three flows.

Considerable levels of automation can be achieved when these three flows can be fully integrated and when data can flow freely in a trusted and secure way between these three flows. In practice, that would mean, for example, that the data from a temperature sensor in a container, confirming the goods arrived in good condition at the port of destination, could automatically trigger a payment for the shipment, because the data is not only shared in a timely manner but it is fully trusted by the financial system. This is exactly where Blockchain technology adds value: it provides the necessary trust in the data to automatically trigger processes in one system, based on data from another system. Even if that other system is run by a party so far away in the supply chain that their exact identity is not known, their data can still be trusted.

### Where are we today?

Digitalising the CoO through the use of Blockchain technology is a first step towards the integration of different logistical flows and has great potential to speed up administrative procedures, as data is not only digital but fully trusted by all parties in often long and complex supply chains.

With our vision and pilot project, we connect with the existing digital platforms used by the issuing bodies, the exporting companies, and the customs agents, to allow the greatest level of automation possible, while still keeping these platforms in place and thus reducing the need for complex institutional changes. We are working actively to involve all relevant authorities as closely as possible in the CoO pilot project. We note that the current COVID-19 pandemic makes several authorities more receptive to fully-digital solutions. One of the goals of this pilot, through the involvement of a large number of companies in them, is to demonstrate to customs authorities the willingness of industries to push forward with the full digitalisation of the CoO processes.

<sup>5</sup> [https://www.europarl.europa.eu/RegData/etudes/STUD/2020/641544/EPRS\\_STU\(2020\)641544\\_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/STUD/2020/641544/EPRS_STU(2020)641544_EN.pdf)



# Conclusion

Digital transformation is not new, but innovative technologies like Blockchain technology provide the trust and the security to share and verify documents.

Blockchain technology can accelerate the adoption of fully digital processes and help decrease costs, mitigate risks and improve efficiencies. Albeit initially focused on CoOs, this solution can also support bill of lading, proof of transport, health certificates (e.g. Phytosanitary), other origin compliance processes etc.

This pilot project is an opportunity to see how blockchain technology is being used at a scale involving multiple parties and a high volume of documents.

**If want to learn more about this pilot and the next steps, get in touch.**



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