

standards to promote greater connectivity and interoperability between the disparate blockchain networks (Higgins, 2017a). Ethereum co-founder Joe Lubin, Bitcoin scientist Adam Back, Hyperledger executive director Brian Behlendorf, and Richard Gendal Brown of distributed ledger consortium R3 are working collectively to explore approaches to make networks interoperable, either through the development of “interledgers” capable of facilitating interoperability, or through an identity solution that allows users to own their own profiles (Del Castillo, 2017).

The multiplicity of platforms also has more practical consequences, in particular when it comes to international trade, as an international shipment can touch a dozen different ledgers. For parties involved in such transactions, hosting a dozen nodes would be highly impractical. One specific approach being discussed within the Blockchain community consists of creating an inter-ledger notarization system to allow authorized parties to verify transactions, irrespective of which ledger they are created on (UN/CEFACT, 2018). Inter-ledger notarization could be performed by a sole entity or different entities – at the cost, however, of reintroducing some degree of centralization.

(ii) Data standardization

Beyond the purely technical interoperability aspects at the level of interfaces, equally important challenges lie in aligning the semantics (i.e. the meaning of the information being exchanged), developing standard datasets that cover all data used for information exchange for import, export, transit, transportation and finance, and aligning processes. Customs, logistics companies and traders, for example, often do not use the same semantics and view data differently. Is the “port of unloading” the same as the “place of discharge”? Should “product identification” mean the national nomenclature code (used by customs), the “said to contain” (used by transport companies), or the global product classification code (used by traders)? This aspect has been the focus of active work in recent years in order to ensure that the various parties involved understand the same data in the same way. UN/CEFACT and the WCO have both been working on data models to develop a universal language for cross-border data exchange. UN/CEFACT, for example, proposes its Core Components Library²⁰ and associated reference data models as base building blocks for blockchains to achieve better data interoperability, and has developed a recommendation on data simplification and standardization (Recommendation No. 34), while the WCO has developed its own data model.²¹ These challenges, which are linked to the digitalization of trade, predate the advent of Blockchain. However, the development of blockchain use cases that span various stages of international trade, from trade finance to customs procedures, transportation and logistics renders the need for a multi-stakeholder approach on these issues even more critical.