



Distributed Ledger Technologies for Public Good: leadership, collaboration and innovation

Proof of Concept

Reducing Friction in International Trade

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Foreword

My report *Distributed Ledger Technology for Public Good; leadership, collaboration and innovation* [2017] was written to highlight the need, and significant opportunity, for government to take a leading role in the practical testing and application of distributed ledger technologies (DLT) across the public and private sectors in the service of the UK, its businesses and its citizens.

That broad ambition was already, in 2017, encouraged by advances in DLT since Sir Mark Walport's ground-breaking *Distributed Ledger Technology: Beyond Blockchain* [2016]. That report identified DLT's potential to transform the delivery of public and private services and to redefine the relationship between government and the citizen in terms of data sharing, transparency and trust.

With the right mix of leadership, collaboration and sound governance, DLT offers a step change for service delivery in both the public and private sectors. By reducing data fragmentation and enhancing traceability and accountability, DLT promises cost-savings and efficiencies on a scale sufficient to impact national finances. DLT's facilitation of business processes, based on common and authoritative reference and transaction data, provides the means to derive improved returns and efficiencies from past and future investments, including legacy systems, through enhanced interoperability.

My report urged that next steps should test our working hypothesis, that DLT could play a valuable part in enhancing the delivery of government services whilst securing the UK's competitive position as a global leader in technology-based innovation and protecting the security of government and citizens' data. Recommendations thus focused on ministerial leadership, research, standards and the need for proof of concept trials.

I published a report update in 2018 highlighting the considerable ongoing collaborative progress made over the intervening 12 months and called for action inside government to address barriers to further development. One of a series of connected events was a collaborative workshop in September 2018 involving participants from government, industry and academia. The Reducing Friction in International Trade (RFIT) project grew out of that meeting and is an excellent demonstration of the collaboration and innovation generated by the report.

The RFIT project was intended to provide a digital innovation ecosystem/sandbox in which UK government departments could develop their requirements/designs/solutions in a "safe environment." The RFIT project applies DLT and internet of things technologies to Australia/UK wine imports transforming the efficiency and security of supply chain data management and the visibility and utility of every element of the data. I believe it is now time for government to act decisively at scale to harness the benefits of DLT and every aspect of 4IR for all citizens, business' the state and all our tomorrows.



Reducing Friction in International Trade (RFIT)

Proof of concept

Moving from a linear “chain” model for data consumption and assurance in supply chains to an ecosystemic one, where one single but comprehensive strand of data is generated at the point the commercial contract is entered into and all actors involved in the transaction have safe, assured and controlled access to the same data.

Problems with Existing Supply Chain Data Management

Although the data required to manage the importation process is present in the current wine supply chain, much of the data is duplicated in several documents leading to repeated manual entries by supply chain participants which introduces errors. There is an administrative and cost overhead in reconciling data or ascertaining its correctness by comparing it to what has been entered by another participant. Data entry errors cause distrust and reputational damage amongst participants and statutory bodies alike.

Project Goal

To determine how Distributed Ledger Technology (DLT)/Blockchain and Internet of Things (IOT) technology can be used to reduce the friction in international trade by:

- Simplifying the importation process.
- Ensuring fiscal and regulatory compliance
- Reducing opportunities for fraud
- Delivering cost and efficiency benefits through the supply chain and at the UK border.

Project Details

The RFIT project has been formally running since March 2019.

The project has been unfunded for most of its duration, but recently has been sustained by some innovation funding from HMRC. It operates with a substantial amount of good will with representatives from:

- UK Government departments HMRC/FSA
- Australian Export authorities - Wine Australia/ATO
- Chainvine Ltd (Dr Rajiv Mathur)
- Importers/producers
- Association/trade body representing the Wine and Spirits trade in the UK
- Exeter and Surrey University (Mike Brookbanks as Programme Lead)



The application of IoT devices to the physical consignments and tracking via GPS technology ensure there is an assured link between the physical and digital manifestations of traded goods. Not only does this enable assurance of individual consignments but the aggregation of data for the purposes of strategic “mass balance” monitoring and risk management.

The Platform

Developed by Chainvine Ltd (<https://Chainvine.com>) and based on a mix of DLTs technologies Ethereum, Sawtooth and Corda. The platform also has capability for integration with other market ecosystems based on different DLTs such as Fabric and others.

The potential value and benefits generated from the implementation have been reviewed with wine producers, importers, freight forwarders, HMRC and FSA.

Functionality

The RFIT project has established how DLT/Blockchain and associated digital technologies can be used to create the market ecosystem where:

- Asset data needed by regulatory and fiscal authorities (e.g. Customs/Excise and Food Standards Agency) can be stored and generated in the required formats so that it integrates with current systems.
- Provenance data meets the requirements for food safety assurance
- It establishes collaboration between all parties.
- It will also consider regulatory/policy requirements from border agencies and will assist/support current initiatives.

The RFIT platform supporting the wine importation market ecosystem:

- Collects data upstream (from the Wine Producers) relevant to Food Standards Agency (VI-1 and Label details), Port Health Authorities, Customs/Borders and distributes it to authorised parties downstream in a secure manner.
- Builds data consent, stewardship and security into the RFIT platform from the start.
- The ‘paperwork’ processing required at the borders is reduced, with the potential of creating a “smart contract” to further automate processing. There is already a single stream of data relating to that contract, accessible at any point by parties with the appropriate access rights. The platform already provides varying levels of tracking capabilities using:
 - IOT tracking devices that are capable of capturing multiple parameters – location, temperature, humidity etc.
 - Tracking QR codes uniquely based on the submitted data.
- Enables different participants including importers, exporters, IOT providers, legal services providers and other relevant parties to become part of an efficient system that will meet the objectives of the project.
- Is built in an ‘open’ way allowing for extension to include for example, data from shipping/courier agents directly.
- Integrates with the HMRC and FSA requirements and other relevant processes and systems.



Results

Benefits of an integrated data source that is immutable, secure, distributed and trusted across the supply chain on the RFIT platform:

- Reduction of the 'Cost of Trust' amongst ecosystem participants by bringing in non-repudiation and transparency while protecting 'business secret/commercially sensitive' information for all participants
- Reduction of data duplication and manual data entry
- Reduction of errors and the administrative overhead
- Improved trust across all parties - including government
- Improved data visibility/traceability/tracking across the participants
- Reduced the cost of document transportation/courier.
- Ensures fiscal and regulatory compliance

Perhaps the most important point is that the full benefits will not be realized if electronic documentation is not accepted by UK Government

It is also clear that new governance and operating models are required to determine how these new technologies should be responsibly innovated to ensure they deliver for the Public Good.

Conclusion

At the Second Reading of the Trade Bill 2020, International Trade Secretary, Liz Truss MP said "in developing our own trade policy for the first time in over fifty years we will use technology to ensure that our trade agreements are Fit for the Modern World." The commitment to collect and share trade data will undoubtedly make it easier for trade policy to reflect the interests of businesses across the UK and is welcome. However, we can and should go much further.

This impressive proof of concept has demonstrated the clear value of a government commitment to the use of electronic documentation in the supply chain process. This commitment now needs to be fully realized across all sectors. This truly collaborative and innovative project also has the potential to contribute to the establishment of a Utility Trade Platform (UTP) for the UK. A Utility Trade Platform would be available to any and all traders into and out of the UK to instigate their commercial transactions through it in the sure knowledge that its use would generate all the data required by all economic and regulatory actors in their supply chain. The aim would be for this to put UK industry at maximum competitive global advantage in the post-Covid and -Brexit future and fully leverage the UK's lead in understanding of and deployment of the technology behind such a platform, truly 'Fit for the Modern World'. As I have long argued, we can achieve all this potential with the right degree of leadership, collaboration and innovation.