



JUNE 2018

Supply chains on blockchains¹

By Christopher Berg, Senior Research Fellow, Professor Sinclair Davidson and Associate Professor Jason Potts² Blockchain Innovation Hub, RMIT University

Globalisation 2.0

Blockchain technology is shaping up as one of the most disruptive new technologies of the 21st century, facilitating an entirely new decentralised architecture of economic organization. While still experimental, it is disrupting industry after industry, beginning with money, banking and payments, and now moving through finance, logistics, health, and across the digital economy. These waves of innovation are being driven by both new entrepreneurial startups as well as by industry dominant firms reimagining and rebuilding their business models and services to use blockchain technology. Trade platforms and supply chains are shaping up as the major use case for blockchain technology, and we explain here how this may lead to a second phase of globalisation.

Breakthroughs in the technology of trade can have far-reaching consequences. Sailing ships and steam ships, refrigeration and aircraft were all watersheds in the making of the modern world, but two technologies of trade delivered us the modern era of globalization: these are (1) the shipping container, and (2) the WTO (formerly known as the GATT).

The invention of the shipping container in 1956 led to a revolution in international trade, birthing a new phase of globalisation. Blockchains, invented in 2009, promise a similar revolution. Blockchains offer a fundamental architectural change in the way firms and governments manage international trade, with enormous efficiency and productivity gains.

But, just as the shipping container required significant investment to bear fruit—and came up against the interests of the unions, regulators and ports—blockchain-enabled trade will require substantial upfront investment in new systems and will inevitably challenge existing interests. In the 1950s the shipping container was the solution to the problem of the high expense in money, time, and security to load



cargo in and out of ships. Handling costs were high, operations were slow, and theft was rife.

Today the constraints on trade consist of the ever-increasing complexity of the data, records, payments and regulatory permissions that accompany goods as they travel across the world. Every good moving along a supply chain is accompanied by a data trail, often still as paperwork, to track bills of lading, invoices of receipt and payment, origin, ownership and provenance, as well as compliance with vast schedules of trade prohibitions and environmental regulation, taxes and duties.

The shipping container is a physical coordination technology, while the WTO is an institutional coordination technology. At the Blockchain Innovation Hub we believe that blockchain technology – as tradetech – is shaping up as the third great technology of trade.

The Cost of Information and Trust

Blockchain technology can solve a major and growing problem with the global trading order – namely the problem of information. Every time a good or service moves, information moves with it. The quantity of information associated with each product continues to grow, and the costs of dealing with this information, from compliance, auditing, verification – trust, in a word – is becoming a greater and greater share of the costs of the global trading system.

This information includes provenance and inputs – the information on a label. It includes trade- finance, bills of lading, shipping and handling information, security clearance – the commercial and administrative information. It includes the documentation of where it's been and where it's going, and who has handled it and who hasn't. And it includes all the information that each country requires in relation to customs and duties, biosecurity, labour and environmental regulations, compliance with various treaties – a vast rigmarole of auditing and compliance, each of which is necessary, desirable and costly. With each day, the information burden increases, not decreases. As the information cost of trade increases, it is not simply enough to digitize everything, because the real problem is that we need to be able to trust the information that is there.



Tradetech

Globalisation 2.0 will be built on tradetech, and the crucial infrastructural component of tradetech is blockchain. Blockchain technology, which is a distributed, append-only, peer-to-peer, trustless secure ledger, is almost custom-made for trade-tech.

It provides an infrastructural platform upon which to build a new information architecture for globally tradable goods – and to do so in a way that is fully digital, tamper-proof, low-cost, end-to-end secure, verifiable, transparent, scalable and computable. What cryptocurrencies did for money tradetech will do for globalisation.

Tradetech will integrate the benefits of fintech into trade networks. Crypto-based models of payments, trade finance, insurance and other risk management tools will be automated. Tradetech will integrate the benefits of regtech into trade networks. Verification and compliance with local regulations will be automated. Tradetech will power-up logistics technologies with blockchain affordances such as smart contracts, decentralized autonomous organisations (DAOs), and the full technology stack that includes AI integration.

So we think of blockchain as a next-generation infrastructural technology for the global movement of goods and services. Service exports have the same constraints with respect to compliance with certification, credential verification, and quality standards assurance. These same problems apply generally to the movement of people too. We are still yet to weave together a seamless global system of identity documents, education and trade certification and permissions, and taxation and other public liabilities.

Example: Benefits for Australia

Tradetech facilitated supply chains could to bring significant advantages to Australia, and her trading partners. This is win-win because there are both consumers and producers on each side.

For Australian exporters, there are at least two obvious advances. Tradetech facilitated Australian Agriculture will significantly boost the quality of provenance claims as to origin and quality of product. When this transparent verifiable information passes at much lower cost to final consumers, more of that assurance value passes back to suppliers, boosting primary producer income.



We are starting to see this already with start-ups in the primary export industry, for instance with Beef-ledger, Agridigital and Grainchain. We will also likely see the benefits of similar assurance in advanced manufacturing, such as in aerospace, medical devices, pharma and other high value bespoke manufacturing where quality is paramount and certification is costly. Or in other areas that rely heavily on intellectual property, such as creative industries.

Blockchain based tradetech will benefit producers and consumers by lowering the cost of providing and processing high value information that rewards legitimate quality production and minimizes rent-extraction along the way.

Crypto Free Trade Zones

Blockchain-based next-generation trade infrastructure opens the prospect of a next generation of crypto free trade zones. These may overlay existing trade zones – within bilateral or multi-lateral zones – with a standard protocol for information handling. This would lower the transactions costs of trade, which economic theory predicts would increase the quantity of trade, and therefore value creation.

But blockchain trade areas could also build on private supply chains and infrastructure, as with consortia such as the IBM-Maersk-Walmart alliance, or with the recently announced adoption by FedEx of blockchain technology. This is the difference between say email (an open standard) and Facebook (a proprietary model). The strength of the closed network model is that it incentivizes investment. But it creates power, and invariably requires regulation to constrain that power. And regulation in turn stifles innovation.

We need to start thinking about how we want free trade to evolve in the blockchain era. Global open standards should be our ambition, because this brings the maximum prospect for growth and innovation. But open standard protocols are challenging to get started, because it can stumble on a coordination problem at the outset. This is why in order to build the next generation of globalisation on blockchain infrastructure we will need to solve the open standards coordination problem.

-
- 1 This article is based on a talk given Australia-China Blockchain Event, 13th March 2018.
 - 2 Contact author: Jason.potts@rmit.edu.au