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**POLICY BRIEF**

# TRADE FACILITATION IN DEVELOPING COUNTRIES: CAN BLOCKCHAIN PROMPT A LEAP FORWARD?

The entry into force of the Agreement on Trade Facilitation of the World Trade Organization in February 2017 propelled the concept of trade facilitation into mainstream policy dialogue and brought major attention to the challenges traders face, particularly in developing countries. At the same time, e-commerce (electronic commerce), just-in-time delivery, global value chains and smart shipping have been on the rise. Cross-border business-to-business, business-to-consumer and even consumer-to-consumer e-commerce, for instance, is poised to become globally ubiquitous, bringing along with it challenges for Governments. The challenges involve the implications for compliance, revenue collection, consumer protection, competition policy and safety and security. Amid these developments, how can Governments keep trade risks low and, at the same time, facilitate cross-border trade? Can modern technologies, such as blockchain, provide a solution and allow developing countries to make leaps forward in efficiency?

## Meeting the trade facilitation challenges ahead

Governments and markets need to adapt to emerging trends in trade facilitation by paying attention to the following issues:

- **Innovations** that speed up cross-border commerce while ensuring trade compliance and lowering trade risks are increasingly important.
- **Digitization** of trade procedures has become more crucial. It enables interconnectivity, interoperability and integration of hard infrastructure and software systems across regions and critical corridors. Government legacy information technology (IT) infrastructure needs to be modernized. The existing IT systems of many Governments seem inadequate to address emerging trends. Most lack basic interoperability which results in multiple declarations, duplication of documents and replication of procedures, burdening traders with extra hours and additional costs.

- **Governments' ability to exchange trade data across borders**, while maintaining reasonable data ownership and protection, has become central to the global trading regime. This will facilitate compliance and the speedy processing of goods from their origin, in transit and in destination countries.
- Increasing **consumer demands for higher transparency** in supply chains and clarity on sources of goods is making technologies that enable traceability of supply chains ever more important.

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**In this context, the promise of blockchain technology lies in its ability to promote community collaboration and shared privileges while protecting sensitive data and privacy.** The technology's capability to maintain data within a community, with private ownership preserved, and allow specific information to be shared is not only novel, it is also a game changer. Indeed, a growing number of companies and **Governments have already successfully deployed the technology in diverse international trade activities** with modest in the data is simultaneously recorded by all computers.

This new approach of running services, utilities and even autonomous organizations on the Internet brings with it a myriad of new possibilities. In the table below, **some of the fundamental features of blockchain technology** that make it particularly suitable for trade facilitation, along with potential areas of suitability, and for compliance procedures are described.



*Photo credit © Jan Hoffmann*

outcomes and have reported potential for scalability and commercial success. Some areas of promising success beyond finance include the distribution of refugee benefits in a privacy-enabled environment,[1] aid tracking,[2] provenance of supply chains,[3] automation through the integration of the "Internet of things" in shipping,[4] issuance of digital bills of lading,[5] health care[6] and agricultural trade.[7]

## How can blockchain contribute to trade facilitation?

A blockchain is a form of distributed ledger technology, with data encrypted and recorded across a network of computers and updated in real time, through predetermined rules called consensus algorithms. Each computer connected to the network has an identical copy of the data on the network and every change

## Blockchain in developing countries

Like mobile telephony or mobile banking in the past, blockchain presents a new opportunity to leapfrog legacy IT systems.

Adopting blockchain can bring enormous benefits to developing countries. In many developing countries trust is low, and the price of intermediation remains high. Therefore, any opportunity to replace the need for institutional and personal intermediation, and the accompanying opportunities for corruption, with technological intermediation would be a relief for businesses.

In international trade procedures, efficiency remains low in many developing countries, as most administrative processes are still handled manually with multiplicity of paperwork. Blockchain technology can, for instance, support the issuance of unfalsifiable electronic documents

1   United Nations Entity for Gender Equality and the Empowerment of Women, 2018, UN-Women and World Food Programme harness innovation for women's economic empowerment in crisis situations, 18 September.

2   World Food Programme, 2019, Building Blocks Project Overview, available at https://innovation.wfp.org/project/building-blocks (9 August 2019).

3   *Forbes,* 2016, This emerging tech company has put Asia's tuna on the blockchain, 30 September.

4   *Harvard Business Review*, 2019, Maersk – reinventing the shipping industry using [Internet of things] and blockchain, 10 September. Available at https://digital.hbs.edu/industry-4-0/maersk-reinventing-shipping-industry-using-iot-blockchain/ (accessed 30 January 2020).

5   Global Trade Review, 2018, CargoX goes live with blockchain-based bill of lading, 23 August. Available at https://www.gtreview.com/news/fintech/cargox-goes-live-with-blockchain-based-bill-of-lading/ (accessed 29 January 2020).

6   The Startup, 2018, How blockchain technology can transform the healthcare sector? 27 April. Available at https://medium.com/swlh/how-blockchain-technology-can-transform-the-healthcare-sector-604d1bcdc16b (accessed 29 January 2020).

7   *Forbes,* 2019, This Bud's for blockchain: [Anheuser-Busch] InBev is banking on African farmers, 16 April.

| Feature | Suitability |
|---|---|
| Public key cryptography | • Cross-border G2G, G2B or B2B [a] cooperation in data exchange.<br>• Data protection and prevention of data breaches.<br>• Non-repudiable digital signatures and digital identities.<br>• Detection of tampering. |
| Timestamps and cryptographic hashes | • Identification, verification and acceptance of electronic copies of trade documents.<br>• Detection of counterfeits and elimination of intellectual property theft.<br>• Preservation of data integrity in Internet-of-things devices (e.g. from temperature, humidity) and in supply chain provenance.<br>• Detection of tampering and unauthorized intrusions. |
| Consensus mechanisms and distributed systems | • The distributed servers (nodes) of "permissionless" blockchains' can ensure more resilient trade infrastructure that can withstand natural disasters, system outages and cyberattacks thereby ensuring data preservation and business continuity. But this also brings new challenges for Governments regarding data ownership and sovereignty.<br><br>• Permissioned blockchains allow for control, ownership and proprietary advantages but use of distributed systems are less meaningful. This increases risks of centralization making them less resilient and less secure to events such as distributed-denial-of-service attacks, hacks and natural disasters. Hence, data preservation and business continuity are not fully assured. |

[a] Government-to-Government, Government-to-business, business-to-business.

and acceptance of electronic copies that is verifiable without need to contact the issuing authority to reduce trade risks, thus significantly improving traders' experience.

However, challenges abound, and there will be major constraints in ensuring that developing countries participate in the implementation of blockchain technology. Inadequately trained human resources, slow and costly Internet connections, unstable electricity supply, inadequate infrastructure and limited learning opportunities are some of the challenges ahead. In developing countries, where many people and microenterprises and small and medium-sized enterprises do not yet own a computer, the chances of embracing new technologies such as blockchain are particularly low. In the future, however, this can change, especially as barriers to entry for blockchain technology decrease and user-facing mobile phone blockchain applications are developed.

## Blockchain for trade: Potential quick wins for Governments

Today, increasing use of blockchain technology is seen in supply chains to eliminate counterfeits, enable trust and curb intellectual property right violations. Testing of blockchain applications in Governments' trade procedures and compliance however continues to lag. Many digitization efforts pursued by Governments in the area of trade compliance, though, can be deployed on blockchain-enabled ecosystems with greater reliability and better resilience. Many Governments remain on the sidelines regarding the technology and just a few have committed resources for research in the area.

Single windows, e-regulations, certificates of origin and cross-border e-commerce compliance can benefit from a decentralized digital infrastructure powered by blockchain technology. One example is an Inter-American Development Bank project supporting a blockchain-based solution for mutual recognition of authorized economic operators between Costa Rica, Mexico and Peru.[8] Another example is an initiative led by the United Nations Centre for Trade Facilitation and Electronic Business, backed by three Governments, to create a standard for the design of cross-border blockchain-based ledgers for the exchange of certificates of origin.[9]

Electronic payments can also be deployed on blockchains to enhance Governments' revenue collection efforts. This can be especially powerful when delivered in conjunction with "smart contracts", which are automated self-executing computer programs designed on a blockchain, that are triggered by defined circumstances. Examples of this are a payment triggered by

[8] World Customs Organization, n/d, CADENA, a blockchain enabled solution for the implementation of mutual recognition arrangements/agreements. Available at https://mag.wcoomd.org/magazine/wco-news-87/cadena-a-blockchain-enabled-solution-for-the-implementation-of-mutual-recognition-arrangements-agreements/ (accessed 31 January 2020).

[9] United Nations, Economic Commission for Europe, 2019, Cross-border inter-ledger exchange for preferential certificates of

entry into a customs terminal or an automated issuance of final customs clearance documents after specified duties are received from a trader. This would help to ensure compliance with customs duties and reduce underhand payments and corruption.

However, legislative frameworks will need to be reviewed or designed for areas such as electronic signatures and electronic identities to set the environment for mass adoption of the technology.

## Policy implications...
## ...for developing countries

Governments in developing countries will need to actively design policies to promote knowledge building and skills development in blockchain technology to ensure that they are not left behind. Governments need to have research that is ongoing in the application of blockchain and related emerging technologies, while remaining measured in building critical infrastructure on blockchains to allow for technical maturity and regulatory clarity.

## ...for international organizations

Emerging trends in international trade and the arrival of new technologies such as blockchain will transform how these organizations engage with countries.

It is foreseeable that developing countries will need more technical assistance, not only in soft skills and policy guidance, but also in hard skills for building and handling digital infrastructure.

This means that the work of international organizations will need to expand beyond policy dialogues to include more technical cooperation to support technological advancement in developing countries. For instance, UNCTAD has been at the forefront in the delivery of technical tools to developing countries such as single windows through its Automated System for Customs Data – ASYCUDA – programme[10] and trade information portals,[11] thus possessing a wealth of knowledge that can assist countries in the use of emerging technologies.

International organizations will also need to take bold steps in bringing to the forefront the challenges of international standards for various technologies, including blockchain, on governance, interoperability, security and data protection, as well as guidelines for restraining monopolistic tendencies. Intergovernmental bodies such as the United Nations Centre for Trade Facilitation and Electronic Business will need to continue the push for a common language, semantics and standards to ensure that a fitting environment is found for future innovations, but also that legacy systems can be integrated into emerging ones.

Additionally, tools such as the UNCTAD Global Cyberlaw Tracker,[12] which is a global mapping of cyberlaws on the state of e-commerce legislation in the 195 member States of UNCTAD, will become increasingly important for emerging technologies such as blockchain.

Furthermore, advocacy and awareness will be important to create a level playing field for all countries, as large corporate initiatives such as Libra[13] can drive monopolistic tendencies. This will contribute greatly to bridging the already widening digital divide among countries.

Capacity-building in developing countries by international organizations is equally important to ensure that the digital divide between developed and developing countries is not further enlarged, as already evident in the number of blockchain-related patents registered.[14] For instance, UNCTAD has been an implementation partner in the area of capacity-building in many developing countries working towards relevant trade reforms that allow beneficiary countries to meet their obligations under the Agreement on Trade Facilitation of the World Trade Organization and beyond. With this experience, UNCTAD is well positioned to ensure developing countries are fully aware of, and prepared for, the emerging technology of blockchain and how it can support technologically driven trade facilitation reforms in the twenty-first century.

Finally, the rise of open-source software (i.e. free software without copyright constraints) and the increasing combination of open-source and proprietary software means a new paradigm of software development and deployment is at hand. The approach of international organizations to software delivery to developing countries may also require a fresh approach.

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origin using blockchain, United Nations Centre for Trade Facilitation and Electronic Business project. Available at https://uncefact.unece.org/display/uncefactpublic/Cross+border+Inter-ledger+exchange+for+Preferential+CoO+using+Blockchain (accessed 31 January 2020).

[10] See www.asycuda.org.

[11] See http://tradeportal.eregulations.org/?l=en.

[12] Available at https://unctad.org/en/Pages/DTL/STI_and_ICTs/ICT4D-Legislation/eCom-Global-Legislation.aspx.

[13] *Bloomberg*, 2019, Facebook wants its cryptocurrency to one day rival the greenback, 18 June.

[14] UNCTAD, 2019, *Digital Economy Report 2019: Value Creation and Capture – Implications for Developing Countries* (United Nations publication, Sales No. E.19.II.D.17, Geneva).