



BLOCKCHAIN IN THE BELT AND ROAD

CONNECTIVITY 2.0 BETWEEN EAST AND WEST

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SUMMARY

Blockchain, the most prominent distributed ledger technology (DLT), holds the promise to improve the efficiency, accuracy and inclusiveness of supply chains. The Belt and Road Initiative (BRI) is grounded in the belief that nations can achieve significant economic and trade benefits by improving connectivity and reducing supply chain barriers. As the global economy slows, the Silk Road Economic Belt and the 21st Century Maritime Silk Road (a.k.a. One Belt One Road or the Belt and Road Initiative) offers a major development opportunity. However, this growth needs to be inclusive and sustainable to make the initiative successful. It requires a large-scale buy-in over a long period of time – until 2049. The BRI needs trust and should be accessible to small and medium-sized enterprises (SMEs) too. Blockchain has the potential to reduce counterparty risk and minimize fraud for SMEs while

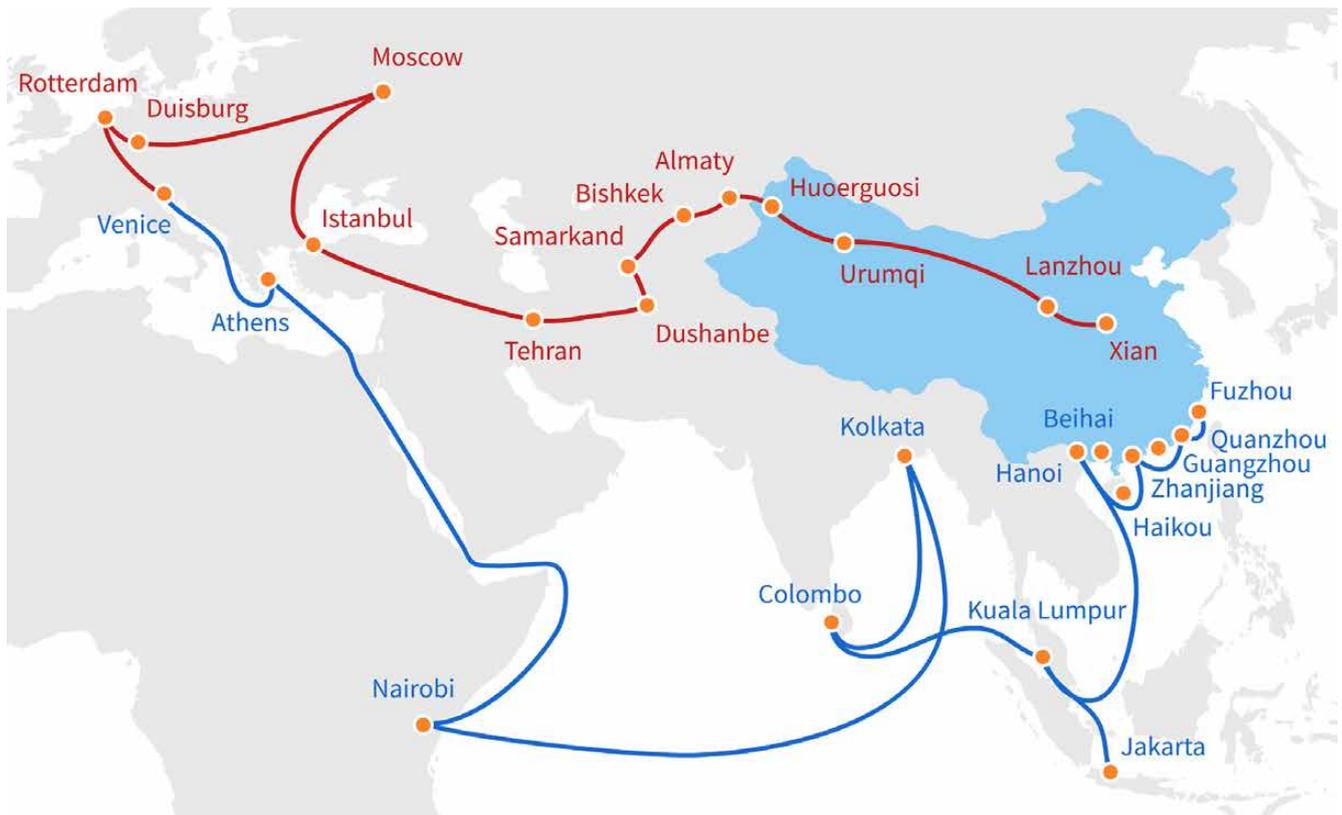
doing business along the BRI corridors. The technology can also curb corruption. Blockchain can provide improved visibility and transparency into assets along the new Silk Road, reducing information asymmetry. Finally, BRI countries attract significant foreign direct investment, which can be increased by adding technology advances, such as 3-D printing.

BLOCKCHAIN IN THE SUPPLY CHAIN

A typical supply chain may involve hundreds or thousands of business transactions every day. These transactions generally take place in a bilateral manner – for instance, between a supplier and a manufacturer or between a retailer and a logistics service provider – and are stored in each of the supply chain actor's own ledgers. There may be several organizations involved in a supply chain. Each party holds its own version of 'truth' about the products en

route. Multiple 'truths' can lead to error, fraud, delays and inefficiency.

Blockchain, as distributed ledger technology, can reduce those complex bilateral communications and informational linkages and leakages by providing a single, shared, tamper-evident ledger that records the transactions as they occur. Transactions in a blockchain are typically confirmed by all participants via a consensus mechanism. Only when validated and recorded in a blockchain does a transaction become permanent. No single participant, even a system administrator, is able to delete or change a transaction unilaterally. Therefore, blockchain enables supply chain participants to share control over the access to – and evolution of – data. While several preconditions need to be met, and depending on the type of blockchain, all related members of a business network can simultaneously have an identical copy of the data at any moment in time.



LARGEST DEVELOPMENT PROJECT OF ALL TIME

The Belt and Road (BRI) was announced by Chinese President Xi Jinping in 2013 and is planned to reach completion in 2049. 'Belt' refers to the overland routes for road and rail transportation, called 'the Silk Road Economic Belt', linking China to Central and South Asia and onwards to Europe. 'Road' refers to the sea routes, or 'the 21st Century Maritime Silk Road', linking China to the nations of South East Asia, the Gulf Countries, North Africa, and on to Europe. A rough cost for the largest economic development project of all time is estimated to be in the range of USD 1 to 8 trillion.

According to the World Bank, the contribution of BRI countries to global exports has nearly doubled in the last two decades: but more can be achieved. On the World Bank Blogs, we can read "Trade of many BRI economies such as Afghanistan, Nepal, Tajikistan, and Laos is below potential due to inadequate infrastructure, weak policy and other gaps. If successful, the BRI could contribute to fill these gaps, boosting international commerce". The BRI can result in a much more inclusive approach to trade, boosting cross-border commerce in all nations along the sea and land corridors.

THE INFORMATION SILK ROAD

There is the digital Silk Road too. It includes internet deep-sea cables - connecting the BRI globally - and satellites that are helping

to navigate machinery from aircraft, to trains, to ships. With the 'Information Silk Road' China is turning the BRI into a system of connectivity, with a land, sea and space dimension. The digital dimension, i.e. internet cables and satellites, of the BRI provides the foundations for overlaying the physical connectivity with digital architecture as the basis for new software-based services. Parts of the software supporting the BRI will include blockchain, which enhances traditional software products and enables new services.

BUILDING CUSTOMER TRUST

The Belt and Road is in construction. Products sold by BRI countries need to gain trust, and blockchain can help to increase trust in a product's digital footprint. The use of timestamping, i.e. the process of establishing a chronological order among sets of events in the blockchain, can prove the existence of certain data at a point in time and the completeness of information. Blockchain can also accommodate a wide range of data, including ownership, location, product specification and cost. Ultimately, it is a way to prove the existence of tracking data and the fact that it hasn't been altered - which raises the level of trust with customers. While blockchain technology can guarantee that the provenance and traceability data has not been modified, it does not guarantee that the data recorded is accurate. Therefore, additional checks and balances may still be necessary to ensure data integrity.

EFFICIENT SUPPLY CHAINS ALONG THE CORRIDORS

Paper-based, manual processes, some of which were created centuries ago, lead to complexity and delays, introduce errors and risks, and stand in the way of reliable, real-time information gathering and tracking. The United Nations Economic and Social Commission for Asia and the Pacific adopted the Framework Agreement on Facilitation of Cross-Border Paperless Trade in Asia and the Pacific in 2016 to advance regional coherence. The agreement is designed to encourage the adoption of digital tools that will facilitate trade, and some estimates suggest full implementation could boost Asia Pacific exports by as much as USD 257 billion annually.

Trade and supply chain flows involve many types of loosely connected participants, which makes reconciling and verifying information painful. Distributed ledgers, by contrast, operate as secure, shared databases, where each participant has a copy of the stored data. When for example a transfer of funds or information about a shipment is recorded, it is validated, made transparent and available to all participants collectively, and updated across the network almost instantly. Only certified parties can initiate transactions by using encrypted digital signatures, which underpin 'smart contracts', a digital protocol that verifies and enforces a contract reliably without human intervention.

Blockchains are suited to large networks of disparate parties, offering a solution



that makes global supply chains much more manageable. While some digital platforms already provide higher levels of visibility for all supply-chain participants, blockchains make such visibility more secure and immutable for all actors by allowing them to share and agree upon important information. This removes data redundancy and crosschecking. With blockchain, the BRI can offer a new quality of cross-border supply chains.

CURBING CORRUPTION

Corruption within trade is one of the most persistent and difficult challenges to overcome – and at its core lies lack of transparency. According to the World Economic Forum, many stakeholders have cited blockchain technology as a tool that can reduce corruption due to its ability to increase transparency. A blockchain system can help to expose and eliminate corruption witnessed in certain public-private interactions, provided those in power are ready to take action. Although this can make it more difficult for unethical behaviour to occur, it is still important to recognize that both existing and new checks-and-balances may still be necessary.

INCLUSIVE ACCESS TO FINANCE

The Asian Development Bank estimated a global trade finance gap of USD 1.5 trillion in 2016, with most of the underserved businesses located in East Asia and the Pacific. That gap stems largely from hugely underserved small and medium-sized enterprises (SMEs). While trade is getting more efficient for large multinationals and companies in developed nations, small companies in poorer countries are paying a high price.

Blockchain, when used in trade finance, helps to remove inefficiencies from existing processes. Over time, it creates records that allow entities such as banks to enhance KYC (know your customer) processes and improve assessments of, in particular, SMEs in emerging markets. Bain and Company argue that blockchain can enable processes that may be used for faster credit risk assessment, minimized human errors in documentation checks, instant verification and reconciliation of records, as well as automatic execution of workflow steps via smart contract, and the instant and secure exchange of data. In this way, blockchain can help to reduce the global trade finance gap, especially for SMEs.

FOREIGN DIRECT INVESTMENT

Foreign direct investment (FDI) in technology will broaden the economic base of Kazakhstan, Uzbekistan and other countries along the BRI. They could leverage such technology advances as 3-D printing to develop their manufacturing industry; in fact, blockchain facilitates the creation of secure digital memories for each product and each part of the 3-D printed products. Smart manufacturing technologies would enable SMEs to make more of their money selling intellectual property (IP) than shipping final products to customers.

The revived railway along the “Belt”, combined with wise technology investments, also creates exciting prospects. Imagine: half-empty container cars traveling across a central Asia desert could advertise their available space in real-time – and at a discount – connecting with potential shippers en route looking

for a low-cost way to send their wares. Centuries after it was established, the New Silk Road could define the future of trade – but only with the right technology in place, including container cars equipped with Internet of Things (IoT) devices, as well as smart contracts enabled through blockchain.

ABOUT THE AUTHOR

Wolfgang Lehmacher is thought leader, business angle, advisor and practitioner in supply chain and logistics. He supports corporate clients, investors and startups. He is Industry Advisor Logistics of Anchor Group and Contributor of Hyperloop Transportation Technologies (HTT). During his career, he was Director, Head of Supply Chain and Transport Industries at the World Economic Forum, Partner and Managing Director (China and India) at the global strategy firm CVA, and President and CEO of GeoPost Intercontinental, the global expansion vehicle of French La Poste. He is member of the IATA Air Cargo Innovation Awards Jury and the Logistikweisen, a think tank under the patronage of the German Federal Ministry BMVI. Wolfgang Lehmacher is FT, Forbes, Fortune, BI contributor and author of numerous books, including The Global Supply Chain.

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