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DIGITAL BUSINESS

How Blockchain Can Revitalize Trade Finance (Part 1)

As a new way to secure the transfer of value, blockchain technology promises to increase collaboration, automation and oversight in trade finance transactions.

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EXECUTIVE SUMMARY

The trade finance industry has emerged as a key focus area for realizing the efficiencies of blockchain technology. Blockchain has the potential to disrupt the trade landscape by making it easier to reduce disputes and fraud to provide delivery and payment certainty, enable transparency of trade asset movement, and facilitate the flow of trade receivables. The result: increased collaboration, automation and oversight in trade transactions.

This white paper (the first of a five-part series) examines blockchain's benefits across three areas of trade finance: payment method automation, trade asset tokenization and payment instrument digitization.

THE TRADE FINANCE LANDSCAPE

Trade finance by banks and other financial institutions is a vital function in international commerce, as it provides delivery and payment assurance to buyers and sellers, and it helps close the trade cycle funding gap for these parties. The growth and sustenance of the \$16 trillion international trade market depends on the easy availability and robustness of financing mechanisms.¹ For this reason, trade finance is often described as the fuel for global commerce.

However, trade participants can be vulnerable to business risks and uncertainties stemming from several factors, including process inefficiencies, variance and fluidity in trade regulations and requirements across geographies, and the operational and logistical complexities that arise when a large number of entities interact. A recent survey by the International Chamber of Commerce reports an increasing trend in litigation and fraud related to trade financing over the last few years.² Recent examples of trade and receivable financing fraud include the \$1.1 billion³ lawsuit against Citigroup resulting from financing falsified receivables, and the loss of hundreds of millions of dollars to various banks in the Qingdao port metal financing fraud involving multiple invoices secured against the same collateral.

Other pain points include:

- Payment and delivery delays due to process overheads.
- A lack of insight into the movement of goods.
- The effort required for counterparty due diligence and contractual compliance processes.

For banks, these obstacles can increase both risk and costs, leading to unfavorable financing terms, especially for small businesses. It is estimated that almost 60% of trade finance applications globally from small and medium-size enterprises (SMEs) are rejected by banks. A recent survey by Asian Development Bank puts the total value of unmet trade financing demand at a whopping USD\$1.6 trillion.⁴ Another study of informal enterprises by International Finance Corp. estimates the financing gap for global micro, small and medium-size enterprises at USD\$2.6 trillion.⁵ These risks and inefficiencies have limited the size of the trade finance market, which currently stands at \$4 trillion to \$5 trillion,⁶ adversely affecting growth in global commerce.

BLOCKCHAIN'S POTENTIAL ROLE

As a new digital paradigm for securing transfer of value, blockchain technology⁷ holds the potential to forever change business processes by redefining value chain interactions, reducing operational complexity and reducing transaction costs. (For more on blockchain, view [our video](#) or read our white paper "[Demystifying Blockchain](#)." For our primary research on blockchain adoption in financial services, see our report "[Financial Services: Building Blockchain One Block at a Time](#).")

Three key features of blockchain – cryptographic security, distributed ledger architecture and a network consensus mechanism – are instrumental in treating the major pain points of trade finance:

- **The cryptographic security underlying blockchain technology enables information immutability and credibility.** This capability renders trade transaction records stored on blockchain tamper-proof, reliable and verifiable by all parties at any time. Data confidentiality and privacy are ensured through permissioned access rights for trade participants.
- **The distributed ledger architecture provides transaction transparency and traceability.** This increases visibility into asset status for merchandise tracking, enables automated execution of contractual obligations through smart contracts, and ensures networks are resilient to downtime and manipulation risks.
- **The network consensus mechanism provides a single source of truth for enabling native issuance of financial assets** (trade receivables and other payment obligations). It also eliminates the associated problems of double spend, fraud and the need for continuous reconciliation between trading and financing parties in the transfer of these digital assets.

Together, these features provide the foundation for building robust and synergistic trade finance ecosystems and platforms that substantially increase the efficiency of trade processes, eliminate fraud, improve asset liquidity and provide better visibility into the trade supply chain.

BLOCKCHAIN'S IMPACT ON TRADE FINANCE

Blockchain's benefits can be looked at across three key areas in trade finance.

1. Providing payment certainty to sellers by automating payment methods.

While payment methods like letters of credit (LC) provide an effective way to mitigate business risks through bank facilitation of the trade flow and settlement process, their value can be seriously limited by high costs, contractual delays and process complexities. Because LC compliance is evaluated based on trade documents and not the actual delivery or quality of goods, ambiguities in the semantics of the legal clauses in the LC contract necessitate the bank to apply discretionary determination when interpreting them. As a result, errors in terminology and interpretation of requirements commonly lead to disputes between parties, with goods sitting unclaimed at the delivery location.

Letter of Credit Process Flow

Payment methods and the underlying trade contracts can be modeled as smart contracts on blockchain to provide payment certainty to the seller.

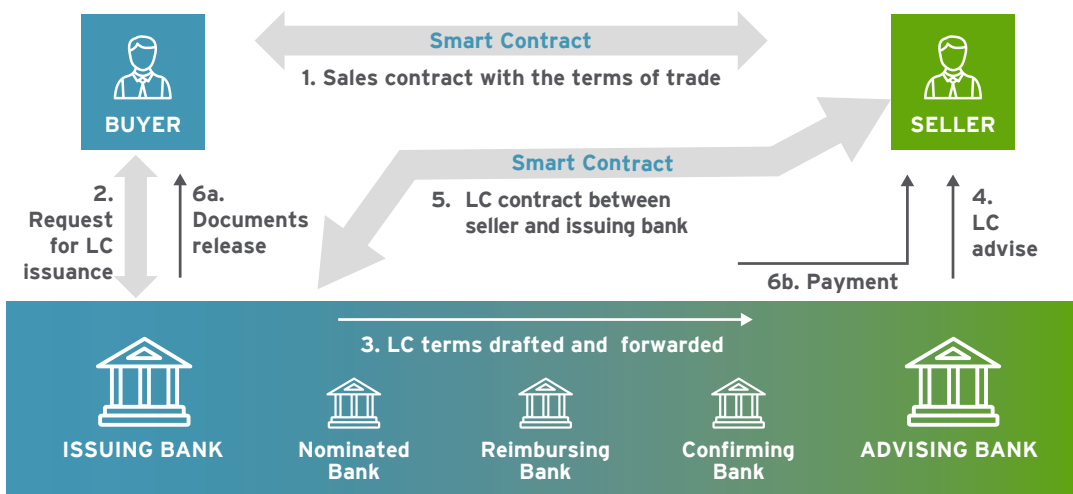


Figure 1

Payments can also be delayed by data mismatches between the LC contract and the underlying trade documents, which either require a waiver or acceptance from the buyer. Other delays can stem from corrections in the trade documents or amendments in the LC contract itself within a short time window before the LC expiration date.

To mitigate the risk of delayed or denied payments, the LC can be modeled as self-executing contracts on blockchain (see Figure 1, previous page). This would automate compliance verification with contract terms and ensure faster payment to sellers by preventing disputes from arising due to ambiguities in the payment contracts. Automating the payment method on blockchain also expedites payments through early discovery of discrepancies and increases the efficiency of the amendment process.

2. Providing delivery assurance to buyers through trade asset tokenization.

Visibility into the status of in-transit shipment is essential for buyers to obtain timely indications of potential delays and damages that can impact fulfillment of downstream obligations. However, buyers often lack this insight into en-route delays or shipment damage due to bad weather, port congestion, customs hold-ups and other reasons until the actual delivery of the shipment. This limits the ability to foresee and mitigate business risk.

Trade documents also move separately from the flow of goods, leading to situations when goods cannot be claimed by buyers until the title or other physical documents have been received. Documents can also be easily forged or manipulated due to vulnerabilities in the transport chain resulting from fragmented interactions between stakeholders, variations in country-specific regulations and trade procedures, and an overall lack of security and common standards. This increases the risk of document fraud for trading parties.

Parties in the Trade Transport Chain

Trade shipment and trade documents (such as bill of lading) can be tokenized on blockchain to provide delivery assurance to the buyer.

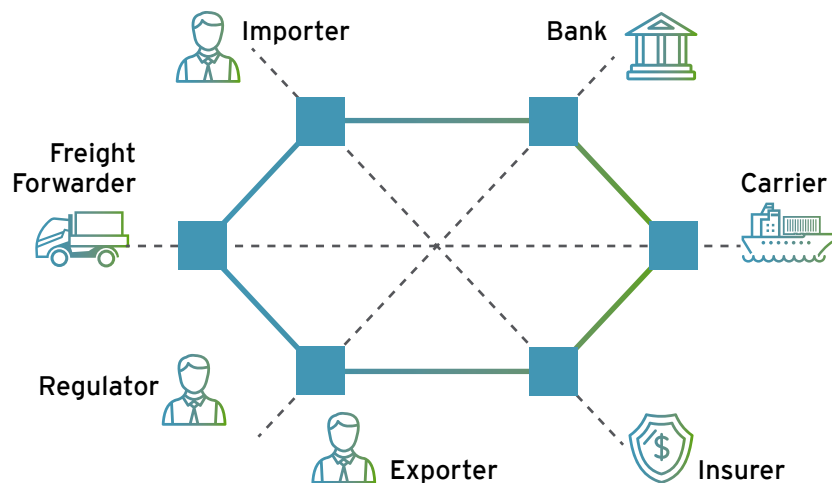


Figure 2

On blockchain, the trade asset can be digitized through crypto-tokens to denote custody or ownership of the bearer and link its transfer between trade transaction participants on blockchain with the movement of the physical asset, establishing a clear chain of provenance. The trade-related documents can also be directly issued and verified on the blockchain by relevant parties.

Asset tokenization on blockchain provides delivery assurance and better risk management for buyers by enabling real-time shipment status tracking and visibility into transport conditions. Managing the flow and transfer of trade documents, such as bill of lading, on blockchain reduces hold-ups in the release of cargo to the buyer due to delayed receipt of trade documents, and it also prevents losses from document manipulation and errors.

3. Mitigating risks and increasing financing revenues for banks through payment instrument digitization.

Trade receivables and other payment instruments such as promissory notes, checks, drafts or bills of exchange act as negotiable instruments that can be transferred to third parties like banks and other financial institutions. This makes it possible for suppliers to get funding to meet their working capital needs by sale or transfer of these payment instruments through discounting, factoring or forfeiting.

However, banks face challenges in detecting deviations and ensuring compliance because of process inefficiencies, such as limited availability of trade information, reliance on documentary proofs of trade, and the high cost of manual screening required, making them vulnerable to business risk. The

Post-Shipment Financing Process Flow

Trade receivables like bills of exchange and approved invoices can be natively issued on blockchain to reduce fraud and enable banks to offer more attractive financing.

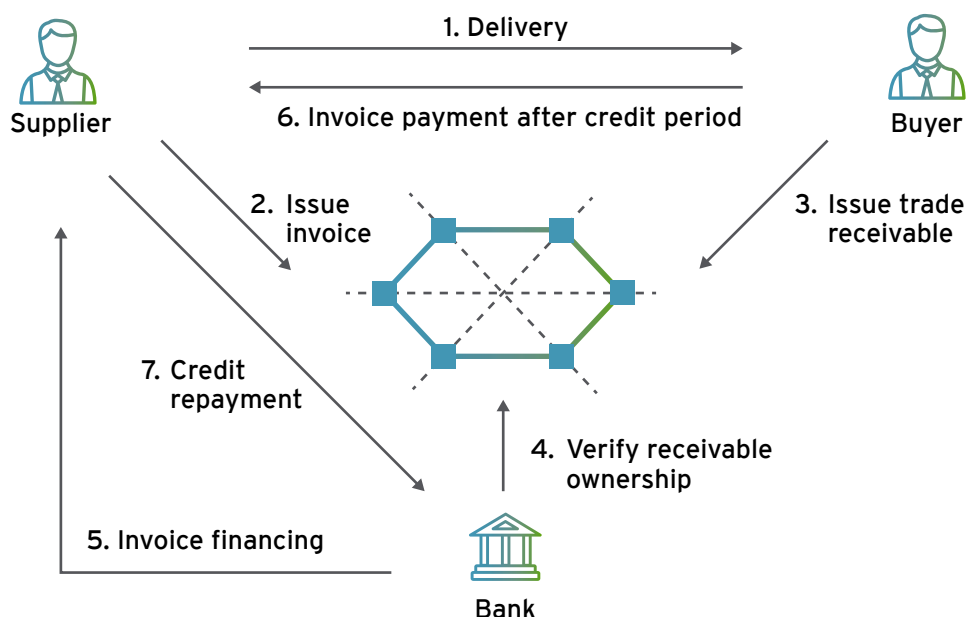


Figure 3



resulting risks include substantial loss from financing fraud, such as duplicate financing and submission of fake receivables, reputational damage, costly lawsuits and ever-increasing penalties in the form of multi-million-dollar fines.


Another key pain point in financing is the unavailability of sufficient and timely trade credit for SMEs, which generally receive deferred payment terms from corporate buyers but need liquidity in the interim to meet their working capital needs. The overhead involved in issuing, storing, transferring and redeeming receivable instruments in paper form also makes for an operationally inefficient, costly and time-consuming process.

Since payment instruments are essentially credit instruments created by the trade transaction, they can be directly issued on a blockchain network as native assets. Payment instruments such as bills of exchange or promissory notes can be digitally created as financial contracts between the issuing and redeeming parties. Direct issuance of payment instruments on blockchain prevents fraudulent invoicing practices, improves SME financing options through increased liquidity of receivables, and enables process efficiencies in managing receivables.

OTHER PROCESS CONSIDERATIONS

In the coming years, we expect blockchain to also play a pivotal role in improving the peripheral business processes that impact trade finance. These include, among others, identity management and document and contract management processes.

- **Identity management:** Identity and reputation management is the cornerstone of any trade interaction. Banks need to facilitate trade transactions to cover the risk of payment or delivery default by the trade counterparty. Blockchain ecosystems can facilitate credible and effective trade party credentialing based on immutable and comprehensive payment and trade transaction history records that can be effectively deployed for assessing the creditworthiness and financial health of the corporate and initiating financing, as well as for ongoing monitoring for funds release and disbursement.
- **Document and contract management:** Trade documents related to financial, regulatory, commercial and insurance can be effectively managed on blockchain by hashing these to ensure that all parties are accessing and making changes to the most recent version of the document. Similarly, trade-related contracts can also be created, updated and amended directly on blockchain



Blockchain technology also lends itself to easier dispute resolution as immutable contract information is preserved and made accessible to all parties on the blockchain.

through a multi-signatory mechanism and carried forward and easily referenced with the rest of the transaction activities. These actions increase the auditability of the trade process and ensure that documents or contract information cannot be tampered with by any single party. Blockchain technology also lends itself to easier dispute resolution as immutable contract information is preserved and made accessible to all parties on the blockchain.

LOOKING FORWARD

Blockchain-enabled trade networks can benefit all stakeholders by reducing friction from the logistical and operational inefficiencies across the trade finance value chain. In the short term, blockchain would be instrumental in optimizing business processes by reducing redundancies and implementation inefficiencies. The longer-term implications of blockchain technology in trade finance would be more profound and could lead to changes in or complete re-design of existing processes.

Though the potential for disruption is immense, multiple hurdles need to be overcome before the promise of blockchain for trade finance can be realized. Some of the critical challenges are related to ensuring adoption and collaboration to reach critical mass to drive network efficiencies, and in managing the operational complexity and associated change management processes in setting up industry-wide blockchain networks.

Blockchain is only one part of the overall solution, and distributed ledger applications require careful strategic considerations and design decisions for production deployment. Additional complexities would arise regarding the legal acceptance and regulatory applicability of such networks and the challenges of platform applicability, scalability and interoperability. As a result, blockchain adoption will need more concerted evangelization efforts to build industry momentum and accelerate implementation.

In upcoming papers, we will provide a deeper look at specific areas and use cases to make blockchain a reality in trade finance, as well as examine in more detail the challenges and process complexities in this field.

FOOTNOTES

- ¹ "2016: Rethinking Trade and Finance," International Chamber of Commerce, 2016, http://store.iccwbo.org/content/uploaded/pdf/ICC_Global_Trade_and_Finance_Survey_2016.pdf.
- ² Ibid.
- ³ "Citigroup Faces Fraud Suit Claiming US\$1.1b in Losses," The Business Times, Feb. 27, 2016, <http://www.businesstimes.com.sg/banking-finance/citigroup-faces-fraud-suit-claiming-us1b-in-losses>.
- ⁴ "2016 Trade Finance Gaps, Growth, and Jobs Survey," Asian Development Bank, August 2016, <https://www.adb.org/publications/2016-trade-finance-gaps-growth-and-jobs-survey>.
- ⁵ "Closing the Credit Gap for Formal and Informal Micro, Small, and Medium Enterprises," IFC Advisory Services, 2013, <https://www.ifc.org/wps/wcm/connect/4d6e6400416896c09494b79e78015671/Closing+the+Credit+Gap+Report-FinalLatest.pdf?MOD=AJPERES>.
- ⁶ "Fraud in \$4 Trillion Trade Finance Turns Banks to Digital Ledger," LiveMint, May 23, 2016, <http://www.livemint.com/Industry/CXfxl1yePlwTDuokXU3c2K/Fraud-in-4-trillion-trade-finance-turns-banks-to-digital-le.html>.
- ⁷ At its core, blockchain is a decentralized software mechanism that enables a distributed ledger system. The technology allows the tracking and recording of assets and transactions without the presence of a central trust authority such as a bank.

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Lata Varghese is a Cognizant Assistant Vice-President who leads the company's cross-industry Blockchain and Distributed Ledger Practice. In this role, she oversees the practice's efforts in providing business and technology consulting and implementation services related to the blockchain and distributed ledger suite of transformative technologies. Lata's expertise resides in business consulting, go-to-market, alliances and partnerships, as well as thought leadership creation. Her focus is on helping clients explore innovative shared infrastructure platforms and solutions that can be enabled by blockchain. Lata has over 20 years of consulting and technology service expertise in the banking and financial services industry and brings wide and varied experience across multiple geographies and services. She obtained her bachelor's degree in electrical engineering from the National Institute of Technology Calicut and an MBA from Xavier Institute of Management. Lata can be reached at Lata.Varghese@cognizant.com | <https://www.linkedin.com/in/lata-varghese-06821a1/>.



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Cognizant's Blockchain and Distributed Technologies Practice offers advisory, consulting and blockchain implementation services to organizations across industries. We uniquely bring together deep industry experience, extensive blockchain technical expertise, and intimate knowledge of the enterprise IT environment to guide our clients' journeys from prototype and pilot through production. Our collaboration with the industry's leading lights, combined with hands-on expertise with both open source and proprietary frameworks, gives us the business and technological capabilities to assist organizations industry-wide in their efforts to make blockchain a value-yielding and dependable shared infrastructure solution across the extended enterprise. For more information, please visit www.cognizant.com/blockchain.

ABOUT COGNIZANT

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