

BLOCKCHAIN'S APPLICATIONS IN BANKING BEYOND BITCOIN



softserve

Blockchain technology disrupted how transactions are made in private markets by making financial services more accessible and transparent. However, there remains uncertainty whether traditional banks will embrace blockchain technology or if, instead, the technology will grow to the point of replacing established financial institutions.

Over the last decade, a lot of attention has been given to blockchain technology — awareness reaching far beyond the niche of Bitcoin. In fact, the topic has found its way into mainstream conversations, where investors and banking experts discuss blockchain and its role in finance. Much of the discourse surrounding blockchain involves a debate over whether distributed ledger technology (DLT) and blockchain have the potential to revolutionize or replace some long-standing elements in the banking sector.

The public criticism many financial institutions have inveighed against cryptocurrencies begs the question, “What are they so afraid of?” Simply put, the answer is, “A lot.”

Many of the services made possible by blockchain reduce the need to work with traditional financial institutions. Cryptocurrency, in turn, poses a threat to the role of custodianship banks play for the money currently in circulation.

Blockchain technology eliminates the need for a verified middle party when untrusted business partners make a transaction. Since blockchain technology utilizes a ledger with no administrator, it is possible to offer financial services such as securitization and payments without needing a bank to act as a trusted intermediary.

Manual financial transactions and processes such as claims, compliance processing, and the distribution of estates are automated with blockchain using “smart contracts.” Once certain conditions are met, smart contract tools allow the self-execution of a contract on a blockchain without any further confirmation by a third party.

DLT is useful for financial purposes that do not require a significant degree of decentralization. The distributed ledger enhances coordination and enables institutions to acquire better governance standards in collaboration and data sharing.

Blockchain and DLT represent significant changes to the banking sector which potentially impact trillions of dollars. Critical services in the banking sector that blockchain technology disrupts include:



1. Payments:

Blockchain provides fast payment processing at a lower fee — especially in cross-border transactions — using a decentralized payments ledger.



2. Digital Assets and Capital Markets:

Blockchain technology creates more interoperable and efficient capital markets by tokenizing traditional securities such as stocks and bonds. Tokenization is also used for alternative assets like private securities.



3. Credit and Lending:

Blockchain technology eliminates gatekeepers in the credit industry, making it more secure to borrow low-interest loans. Innovations such as tokenized identity and zero-knowledge proofs automate the process for borrowers to access capital.



4. Clearance and Settlement:

Blockchain uses distributed ledgers, which reduce operation costs and decrease the time taken to complete real-time transactions.



5. Trade Finance:

Blockchain technology facilitates transparent, secure, and trusted trade deals globally. This allows untrusted parties to trade in real time from any location while mitigating the risks of errors and inaccurate logging.

Read on for an in-depth discussion of how blockchain enables new business models to emerge in the financial sector, including current use cases that incorporate the technology.

1. PAYMENTS

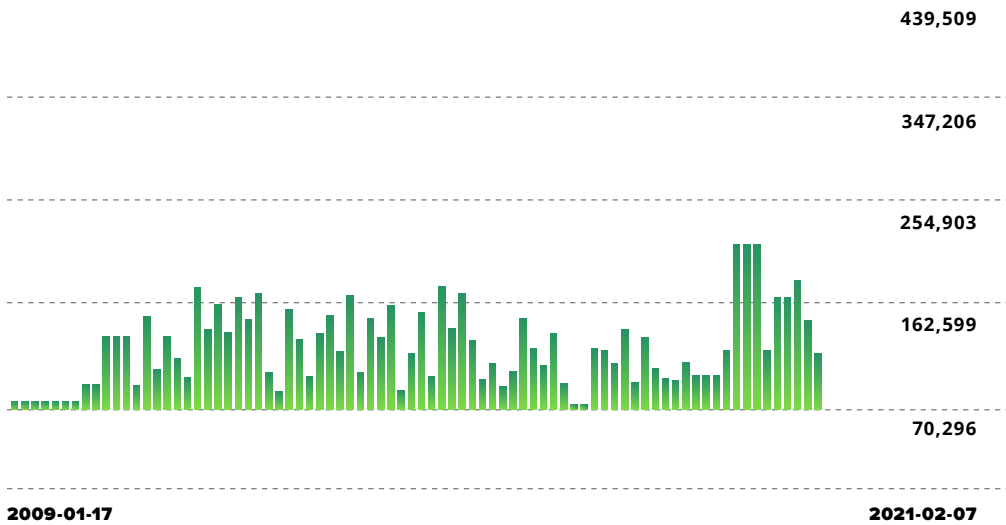


Blockchain technology provides a cheap and secure platform to send payments. The technology reduces the need to verify information from third parties and requires less processing time for payments is less than traditional banks. Among SoftServe clients in the banking and fintech sectors across North America and Europe, 90% of stakeholders believe blockchain will shift the financial sector by 2025.

Currently, trillions of dollars are circulating the globe. As the money moves, it winds through an outdated system characterized by slow transfers and accumulating charges. For instance, when using a bank as an intermediary, a person working in New York must pay an extra flat fee and additional charges of up to 5-7% to send part of their paycheck to a counterparty in London. The banks of both the sender and the recipient each receive a cut and an exchange rate conversion fee. Furthermore, it could take the recipient's bank as long as a week to process the transaction.

Confirmed Transactions Per Day

286,364



A trend shows six times growth for confirmed Bitcoin transactions from 50,000 per day in 2014 to 250,00 by Feb. 2021.

Banks generate significant fee income when facilitating payments, which offers them little incentive to reduce fees.

Cryptocurrencies, such as Ether and Bitcoin, exist on their own public blockchains where anyone can use the platforms to send or receive money. These public blockchains validate and store every transaction. Eliminating the need for verification by a third party reduces fees and processing time. Hence, people across the globe have access to cheap, borderless, and quick payment systems.

The average waiting time for Bitcoin transactions is approximately 10 minutes. However, in some rare and extreme cases, the waiting time can prolong to hours and occasionally days. Even though blockchain technology is not perfect, it is preferable to the three-day waiting time used by banks to process transfers. Additionally, blockchain developers are constantly working on solutions to help process crypto transactions more quickly and at a lower cost.

Governments and regulatory organizations lack control over decentralized crypto-based transactions, making it challenging to shut down. Although, there is still room for oversight since, because the blockchain ledger is public, it allows regulators and law enforcement agencies to track the flow of funds from one party to another.

Cryptocurrencies are a long way from replacing fiat currencies such as the U.S. dollar. However, cryptocurrencies like Ether and Bitcoin experienced upward growth in transaction volume in recent years. The Ethereum network itself managed to record \$1.5 trillion in transactions in the first quarter of 2021.

Some organizations use blockchain technology to facilitate B2B transactions in developing countries.



BitPesa enables blockchain payments in Uganda, Nigeria, and Kenya. The platform has processed millions of dollars, with the transaction volume growing at a monthly rate of 20%. BitPesa has helped bridge the gap in remittance across sub-Saharan Africa, considered the most expensive region to send money on the planet. The presence of crypto platforms such as BitPesa led to a 90% reduction in transfer fees across the region.

One focus of blockchain developers is to make it possible for businesses to acknowledge and accept cryptocurrencies as a mode of payment. An example is BitPay, which acts as a payment service provider and enables merchants to receive and accumulate Bitcoin payments by integrating it with e-commerce platforms.

HUPAYX, a crypto payment startup in South Korea, partnered with several other businesses in the country aimed at establishing payment networks. South Korean consumers make payments using the HUPAYX application and point-of-sale infrastructure in more than 400,000 stores, including shopping complexes and duty-free stores.

Blockchain technology has made it possible to facilitate micropayments, which are transactions of amounts less than one dollar. For example, SatoshiPay, an online cryptocurrency wallet, permits users to make micropayments to access online pay-per-view content. The users can load the wallet with currencies supported by the app, including bitcoin and U.S. dollars.

Developers are experimenting with blockchain technology in intriguing ways, which might take the place of traditional banks' operations — this applies to the fundamental structure of securities as well as other assets.



2. DIGITAL ASSETS

By cutting out the intermediary in asset rights transfers, blockchain technology lowers asset exchange costs, opens up more global markets, and lessens the volatility of the outdated securities market.

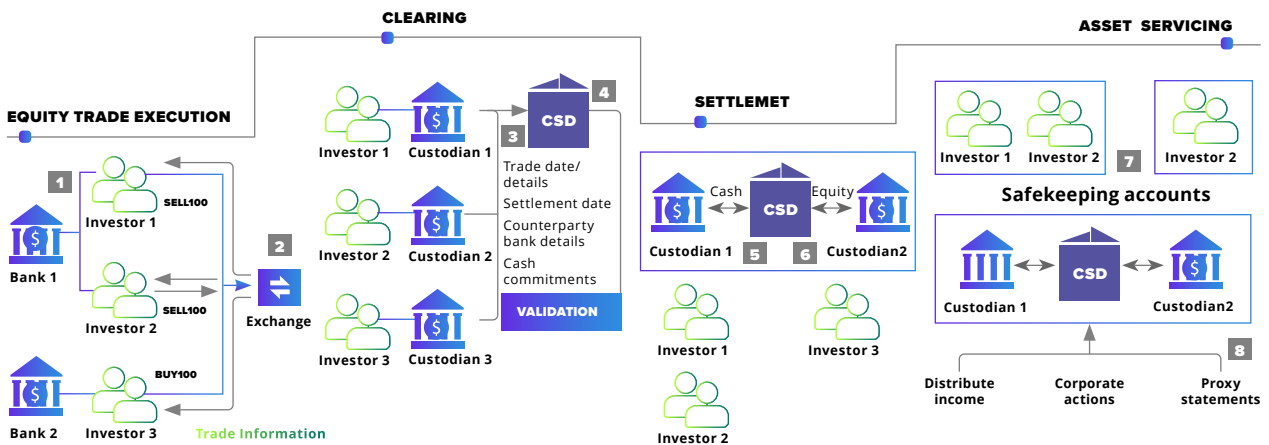


Today's financial markets use a complicated network of exchanges, brokers, central security depositories, custodians, and clearinghouses. All parties keep records based on an antiquated paper ownership structure, which is characterized by slowness, prone to human error, and subject to fraudulent activity. Technology has vastly improved information storage and transmission; however, the heart of the process remains largely the same and requires several intermediaries.

For example, to purchase Apple stock, you can use a brokerage account that

communicates with a stock exchange which in turn maintains an order book to connect buy-side and sell-side demand. Ownership is digitized, but the settlement process is still slow and complex.

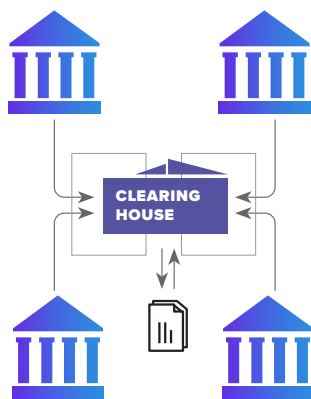
Most consumers prefer to avoid self-custody and the day-to-day activities that come with it, such as safeguarding stock certificates, handling dividends, and bookkeeping. Therefore, they entrust administrators with the custody of their securities. These custodians rely on a complex network of exchanges, brokerages, and clearing firms just to execute and settle trades.



Numerous intermediaries and failure points are involved in the settlement and clearing of orders when using an exchange.

This means that a request to purchase or sell an item is passed through a large number of third parties. Transfer of ownership is complicated since each party retains its truth in a discrete ledger.

The system is not only ineffective, but it also has a high potential for inaccuracy and requires constant settlement. Since each party's books are separate but need to communicate with the others through a series of checks and reconciliations, securities transactions can take approximately three days to be completed. Transactions frequently require human validation

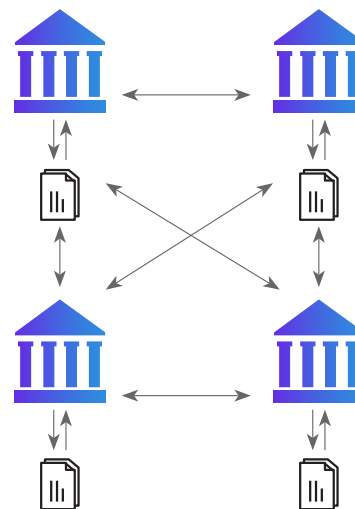


A centralised ledger tracks asset movements within the financial system between institutions

There is significant room for improvement. Each of the four central U.S. custodial banks: JP Morgan, Citi, BNY Mellon, and State Street, manage more than \$12 trillion in assets. However, fees are frequently less than 1% of the revenues generated by all those assets. By eliminating intermediaries like custodial banks via blockchain technology, tokenized securities can reduce asset exchange costs.

due to the involvement of multiple parties, each of which levies a cost.

By building a decentralized database of different digital assets, blockchain technology holds the potential to completely transform financial markets. Through cryptographic tokens that represent assets "off-chain," it's possible to exchange the rights to an investment asset via a distributed ledger that acts as a centralized source of truth that each party can access.



A distributed ledger eliminates the need for central authorities to certify asset ownership. Instead it is held and verified by many institutions to cut down on fraud and manipulation

Additionally, through smart contracts, tokenized assets can function as programmable equity to facilitate the simple execution of stock buybacks and dividend payments. Lastly, putting physical assets on blockchain technology can open up more global marketplaces by expanding access to financial services.

Let's look at the examples of improved digital asset processes through blockchain.

Fintech and Web3 infrastructure company Fortress Blockchain Technologies has built a comprehensive API-driven financial ecosystem that covers several aspects of digital assets, including:

1

Embeddable and app-based wallets.

2

NFT and fungible token minting.

3

Custody, payments, compliance, and trading.

Fortress's focus is on evolving the NFT and Web3 market to use NFTs to form the digital future of how global assets are held. From in-game items to ticketing, financial instruments, and royalties, almost everything on the globe is non-fungible. Through tokenization using blockchain applications, platforms can start merging with these assets to promote utility and transparency and establish clear ownership and authenticity.

By embedding a digital wallet into its existing mobile and web applications, an enterprise can quickly and seamlessly add NFT capabilities to its feature set. Doing so allows users to hold and transact with tokenized assets of all kinds without the need to send users out of their ecosystem to third-party wallets.

Solana, a decentralized blockchain that enables scalable, user-friendly apps for the market, is a critical player in the digital assets space. It is one of the fastest blockchains on the market and a fast-growing platform in crypto. Solana hosts thousands of different projects spanning Defi, NFTs, and Web3.

Technology like Fortress helps make Solana and other blockchains more accessible to the global developer community. Companies can use easy-to-integrate APIs to hold users' NFTs in the wallet as well as serve as the custodian for real world assets. Organizations can also mint tokens to the blockchain. It's easier than ever for enterprises to build platforms that embrace tokens and facilitate the next wave of new users into the world of digital assets.

In addition to increasing the efficiency of publicly traded securities, blockchain technology also brings liquidity to private securities, unlocking trading in a massively valuable asset class.

Another blockchain technology company, Polymath, aims to assist with the migration of trillions of dollars' worth of financial assets to the blockchain. Polymath is developing a market and platform to assist individuals in creating security tokens and establish governance mechanisms that will help these new tokens adhere to rules. Corl, Blocktrade, and Ethereum Capital have all announced agreements with Polymath to introduce security tokens on the protocol.

Financial institutions aren't remaining stagnant either. Since 2017, the Australian Stock Exchange has been working to replace its current bookkeeping, clearing, and settlements system with a blockchain solution created by Digital Asset Holdings.

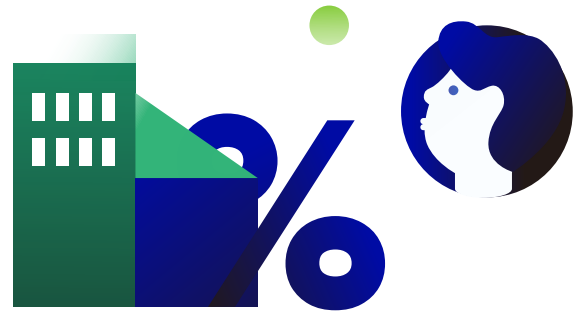
Following suit, in 2020, HSBC declared its intention to digitize the \$20 billion records in assets under its custody. With its Digital Vault technology, the bank "will digitize paper-based records of private placements." As a result, investors can receive real-time data on their assets.

The most significant obstacle to tokenization, despite it being one of the most promising aspects of blockchain, is a lack of clear legislation. Although some legislatures seek to regulate the concept of tokens themselves, regulation should instead focus on the underlying asset represented by the token. Doing so allows a much broader set of assets to be tokenized while still maintaining the appropriate oversight in each scenario.

Consumer, blockchain, and financial institution worlds are gradually merging. Lending and credit are other areas where this confluence can transform how finance functions.



3. CREDIT AND LENDING



Blockchain-enabled lending provides a more secure approach to providing personal loans to a bigger pool of customers. It also saves costs and improves efficiency and security throughout the loan process. In 2019, BBVA completed a live securities loan transaction.

Currently, loans are evaluated by conventional banks and lenders using a credit reporting system. Blockchain technology allows for peer-to-peer (P2P) loans, sophisticated programmed loans that resemble syndicated loans or mortgage structures, and an overall quicker and more secure lending process.

When someone applies for a loan, the bank must first assess the risk that they won't be able to pay the loan back. The bank examines factors including credit score, debt-to-income ratio, and property ownership status to help decide whether to approve the loan. To obtain necessary data, the bank accesses the applicant's credit report from one of the three main credit bureaus: TransUnion, Experian, and Equifax.

Banks calculate the risk of a default based on this information and factor it into the interests and fees they charge for loans. The five central U.S. banks regulate \$3.7 trillion worth of business financing.

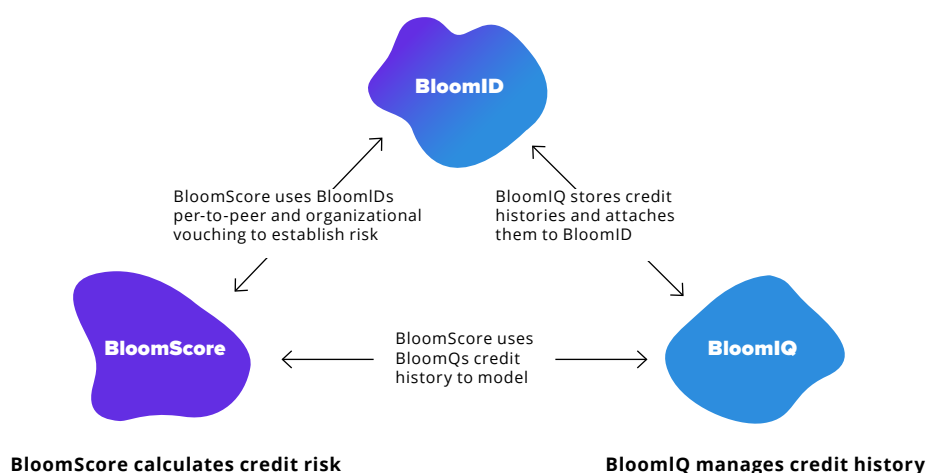
Such a centralized structure can be intimidating to consumers. Additionally, according to the Federal Trade Commission (FTC), one in every five Americans has a "possible major inaccuracy" in their credit score which adversely affects their ability to obtain credit.

Blockchain-based alternative lending provides a more affordable, effective, and secure approach to offering personal loans to a wide customer base. The creditworthiness of applicants can be determined based on a worldwide credit score if there is a decentralized, cryptographically secured register of prior payments. Such a system provides banks with a more robust view of an applicant's credit history and makes it more likely that applicants would qualify for loans.

There are a few intriguing projects involving P2P loans, infrastructure, and credit, even as blockchain lending ventures are still maturing.



Blooming establishes identity and creditworthiness



Without using trusted third parties, the Bloom protocol aims to grant credit based on a history of successful identity verification on the network.

Several businesses are using blockchain to enhance lending for both borrower and lender.

One business, SALT Lending, uses blockchain to make cash loans. The SALT Lending platform allows users to borrow money using any cryptocurrency, such as Bitcoin, Ether, or a blockchain asset, as collateral. The loan's acceptance is based on the value of the collateral rather than the borrower's credit score. While collateralized loans aren't a new concept, collateralizing the loan with an asset such as Ether allows the lender to automate liquidity in a 24/7 market, drastically reducing risk.

Dharma Labs' protocol for tokenized debt is another example of how blockchain enhances lending by opening it up to new providers. The protocol gives programmers the resources and guidelines to create online lending marketplaces, from consumer and margin lending to municipal bonds.

Meanwhile, Bloom is developing a system for controlling identification, risk, and credit scoring using blockchain technology. Such a development benefits everyone, from consumers who can check for credit alerts and identity theft instantly, to enterprises who can easily run background checks.

While most of these startups concentrate on generating liquidity through loans based on users' current crypto holdings, they are also laying the groundwork for a more extensive disruption in lending.

Other financial services, such as clearing and settlement, are being revolutionized by blockchain technology as well.

4. CLEARANCE AND SETTLEMENTS SYSTEMS



Distributed ledger technology enables direct and trackable settlement of transactions better than the existing platforms such as SWIFT. DLT platforms are collaborating with traditional financial institutions to enhance efficiency in the banking sector.

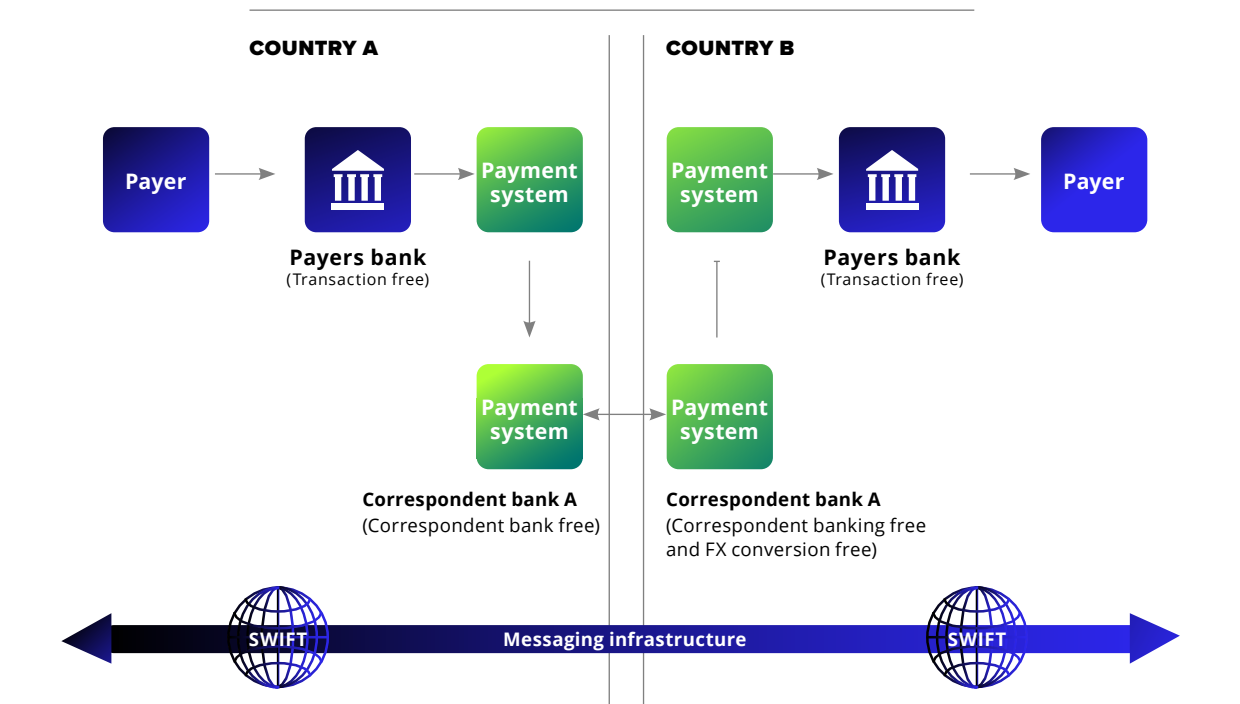
A bank, due to the financial infrastructure involved, takes an average of three days to process a transfer.

It is important to note that the delays do not solely affect the consumers. Financial institutions consider money transfers on a global scale a nightmare. Before reaching its destination, a bank transfer undergoes a complicated system consisting of multiple intermediaries, including correspondent banks and custodians.

Global transfers are only successful when the two banks involved are reconciled in the international financial system — which is the cause of lengthy delays and contributes to expensive transaction fees.

For instance, when sending money from a bank in the U.K. to a U.S.-based bank, the funds are executed via SWIFT. Each day, SWIFT sends an average of 37.7M messages to at least 11,000 banks.

The Correspondent Banking Model



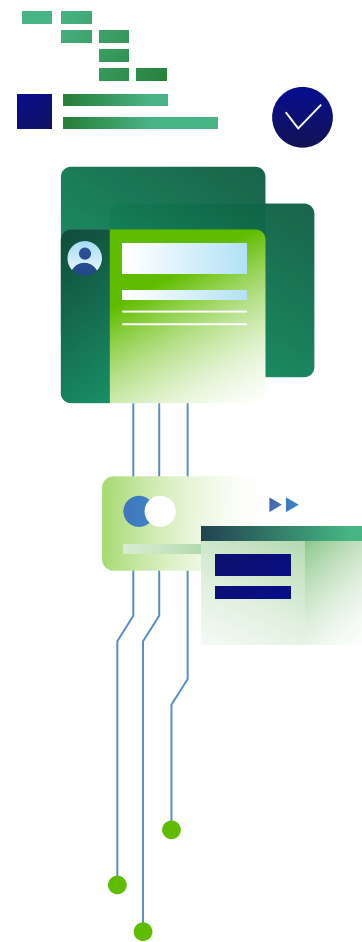
Neither the U.K. nor U.S. bank can complete the transaction directly due to a lack of an established financial connection. Therefore, they must use a central intermediary like SWIFT which has established a relationship with both banks. However, the inclusion of SWIFT in the transaction incurs an extra fee as well as additional time. Banks operating in interconnected networks maintain independent ledgers for the sender and recipient financial institutions. That means that the ledgers must be reconciled before a transaction is completed.

SWIFT utilizes a centralized protocol that, in a real sense, does not send money. Instead, the system asks for payment orders to be made. The processing of real money takes place in the intermediaries' systems. However, each intermediary incurs an extra charge and increases the risk that the transaction will fail. Also notable is that 60% of B2B payments call for manual intervention. The estimated time for such manual intervention is 15-20 minutes for each transaction.

Blockchain technology disrupts global bank transfers by using a decentralized ledger. The blockchain can track international transfers transparently and publicly instead of using SWIFT intermediaries to reconcile the ledgers for each financial institution. As a result, blockchain technology enables a direct settlement of transactions rather than relying on correspondent banks and custodial services networks.

Moreover, blockchain technology provides "atomic" transactions, which clear immediately after making a payment. This new capability helps reduce the inflated costs of maintaining an international network of correspondent financial institutions. Recently, a survey of international banks showed that blockchain technology would help minimize the cost incurred to clear and settle transactions by at least \$10 billion yearly.

There are a few notable providers using blockchain to increase the efficiency of transaction settlement.





Ripple is the most popular blockchain service provider in clearing and settling payments. In traditional international transfers, SWIFT sends one-way messages, similar to emails, to involved banks, meaning that it cannot settle the transaction until each bank screens it. However, Ripple's xCurrent product offers banks two-way communication due to integrating an existing database and bank ledgers. The technology allows real-time settlements and messaging. Ripple has extended its operations into 40 countries and has 300 customers using and experiencing its blockchain network.

Ripple also introduced xRapid, another product that helps to settle cross-border transactions within a short time. Previously, if traders in Mexico and the U.S. needed to conduct a transfer using traditional banks, they needed to have local accounts supporting the local currency. xRapid eliminates that requirement. Therefore, it becomes possible for a Mexican trader to use Mexican pesos to purchase XRP tokens that will be used to pay the American merchant. The American trader can then convert the XRP tokens to U.S. dollars. Ripple claims that the entire transaction and the conversions can be completed in a few seconds.

Another significant development in the bank's distributed ledger technology is R3, which targets a "new operating system for financial markets."

Switzerland's central bank utilized R3 technology for a pilot program, Project Helvetia, aimed at settling large digital currency transactions between two or more financial institutions. In Dec. 2020, the Swiss National Bank (SNB) pronounced Project Helvetia successful. However, it is still unclear whether SNB will issue its digital currency to the central bank during its cross-border transactions in 2022.

Integrating projects such as R3 and Ripple in traditional banks enhances efficiency in the financial sector. Banks focus on decentralizing systems at a small scale compared to a public blockchain that uses its ledger to connect banks and improve the efficiency of payments.

Blockchain projects are not only focusing on strategies aimed at improving processes that already exist — they are looking to accomplish even more.

5. TRADE FINANCE



Since trade finance accounts for 80-90% of global commerce, blockchain's impact on the market will be felt across all sectors that engage in cross-border trading. Those international transactions are considered unprofitable due to trade costs, and paperwork processes can be supported using distributed ledger technology and blockchain. Additionally, it would speed up delivery and require less paper.

Trade financing reduces risk, extends credit, and helps importers and exporters participate in international trade. It is an essential component of the world financial system, yet it typically relies on human processes and written paperwork. Blockchain streamlines and simplifies complicated processes and, in doing so, could save importers, exporters, and their financiers tens of billions of dollars annually.

Over the past few years, blockchain's presence in trade programs has grown, but it is only beginning to solidify its function in bills of lading and credit.

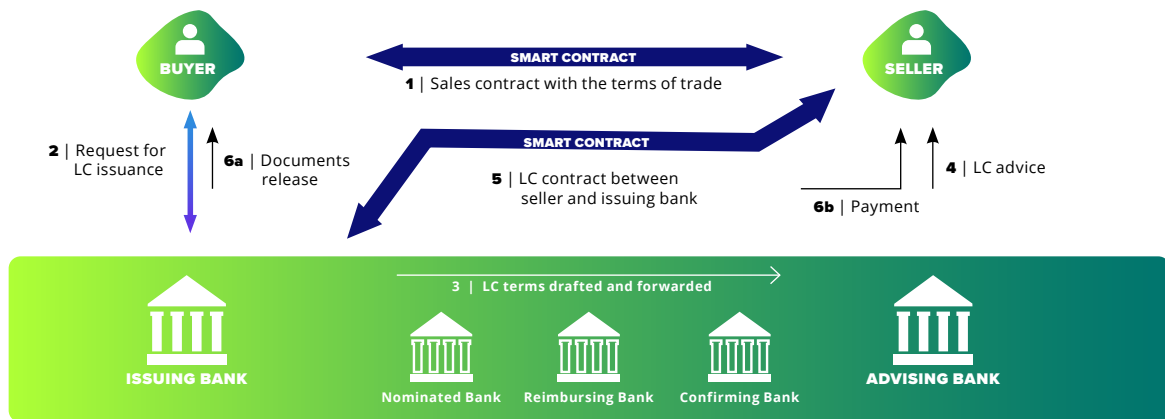
The trade financing industry, like many others, has long been plagued by logistical problems brought on by antiquated, inefficient, and manual documentation procedures. In fact, some banks still frequently deliver physical letters of credit to the two parties to guarantee that payment is made.

Blockchain technology helps exporters and importers give each other more visibility into the shipments passing through their pipelines. It also provides greater delivery assurance by enabling businesses to securely and digitally prove a shipment's country of origin, cargo, and transaction details, along with any extra documentation.

The potential for fraud, which increases due to a lack of confidentiality and minimal control over the movement of goods and paperwork, is one of the biggest threats to trade participants. One of the most common occurrences of fraud is when the same shipment is mortgaged more than once. This scenario occurs so frequently that commodities trade finance banks write it off as a business expense.

Payments between exporters and importers can be made in a tokenized form via blockchain technology and compensation can be conditional upon the delivery or receipt of products. Importers and exporters can use smart contracts to create rules that guarantee automated payments and eliminate the chance of skipped, expired, or repeatedly mortgaged shipments.





The use of blockchain technology in trade financing will lead to increased trust between corporate partners and, when necessary, conceal sensitive data such as prices and trade secrets.

On the consumer side, blockchain provides customers with valuable information regarding a product’s origin and shipping dates — information that is frequently insufficient under conventional systems. Additionally, blockchain allows customers to be informed at every transaction stage, thus boosting transparency and confidence.

Looking at the numerous businesses and banks competing to develop a workable solution, it appears the moment has arrived for blockchain in trade finance.

Standard Chartered announced in 2020 that they were working with the largest bank in Singapore to develop the Trade Finance Registry, a blockchain-based trade finance platform. The technology aims to assist real-time fraud prevention and duplicate financing detection for a single transaction.

Wave, an Israeli fintech company, developed platforms that let finance firms provide blockchain solutions in the form of letter credit transactions.

With the help of Wave's platform, EuroFinance in Barcelona offered Ornuva and Seychelles Trading Company a blockchain solution to improve their supply chain, cut down on transaction costs and documentation errors, and send papers to clients swiftly. From the time the letter of credit was issued until it was approved in this case, the trade process for approximately \$100,000 worth took less than four hours, dramatically less than 1-2 weeks.

By streamlining trade-related operations, such as the issuance of letters of credit and the transmission of trade documents, blockchain and DLT have facilitated trade between Australia and Japan. In this case, IBM provided security while Hyperledger Fabric, developed by the Linux Foundation, handled the trading process.

While most of these programs concentrate on streamlining the procedures for obtaining trade financing, a financial institution's due diligence for each client and transaction is also crucial. Blockchain, with its immutable ledger, makes it easy to verify past transactions and evaluate the trustworthiness of a partner — both essential elements of trade finance.

LEADING THE HYPE OF BLOCKCHAIN TECHNOLOGY

Blockchain continues to grow in value for the businesses that adopt the technology. Despite its advantages, blockchain has yet to be widely adopted and truly tested — implying that it remains on the cusp of its full disruption of the financial sector.

Dedicated supporters anticipate that blockchain and cryptocurrencies will completely replace banks. Others believe that blockchain technology will improve the efficiency of the current financial infrastructure by supplementing it.

It will be exciting to monitor how financial institutions continue to adopt the technology. But one thing is certain: blockchain is poised to transform the industry.

Financial services institutions can be an early adopter of blockchain and DLT or face the risk of losing a competitive advantage. Those who choose to adopt the technology can offer enhanced services to a broader range of clients.

SoftServe provides blockchain solutions to clients looking to make their financial services cheaper, faster, and more secure. Additionally, such solutions help clients enter new markets and develop new revenue streams.

Blockchain experts at SoftServe engage with clients from the strategic stage of defining use cases, cost/benefit analysis, and road mapping, through architecture design and engineering. During that journey, clients receive assistance with such blockchain solutions as asset tokenization, digital asset custody, and deployment automation. A few ways in which our experts make these solutions possible include:

- Smart automation
- Secure cold or hot storage
- dApp infrastructure
- Enterprise integrations
- Payment gateway integrations

For a deeper and more individualized analysis of how and where to apply blockchain technology, schedule a conversation with a SoftServe blockchain expert.

ABOUT US

SoftServe is a digital authority that advises and provides at the cutting-edge of technology. We reveal, transform, accelerate, and optimize the way enterprises and software companies do business. With expertise across healthcare, retail, energy, financial services, and more, we implement end-to-end solutions to deliver the innovation, quality, and speed that our clients' users expect.

SoftServe delivers open innovation, from generating compelling new ideas, to developing and implementing transformational products and services.

Our work and client experience is built on a foundation of empathetic, human-focused experience design that ensures continuity from concept to release.

We empower enterprises and software companies to (re)identify differentiation, accelerate solution development, and vigorously compete in today's digital economy-no matter where you are in your journey.

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